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STATE OF CALIFORNIA
ENERGY RESOURCES CONSERVATION
AND DEVELOPMENT COMMISSION

In the Matter of:)	Docket No. 04-IEP-1G
Preparation of the 2005 Integrated)	
Energy Policy Report (Energy Report))	Electricity Environmental
)	Performance Report
)	

REPLY COMMENTS OF CALIFORNIA WIND COMPANIES
ON THE COMMITTEE WORKSHOP OF JUNE 27-28, 2005

Summary

- Staff Documents that have the effect of rulemaking or policy are being cloaked with the mantle of California Energy Commission authority by PIER (and other) staff.
- Unanswered technical and data questions surround the assumptions, data sets, and conclusions in these Staff Documents.
- These Staff Documents have not undergone rigorous peer review, nor has the public been allowed full and adequate participation in their formation or utilization, and they may be technically flawed.
- As a result, federal, state, and local government entities, including the Commission, may be relying on these Staff Documents to formulate policies, permit conditions, and operating restrictions at wind energy sites in California.
- As soon as possible, the Commission needs to establish scientific peer and public review protocols, with input from all stakeholders, prior to the development and release of PIER analyses.
- Absent a thorough review of the underlying Staff Documents, the Commission should not approve the release of the Avian Impact sections of the EPR.
- The California Wind Companies look forward to working collaboratively with the Commission and its staff to achieve scientific research through an open and transparent process that balances California's state energy policy of maximizing wind generation with minimum degree of avian mortality.

Introduction

Reply Comments are hereby submitted by Altamont Infrastructure Company, Green Ridge Power Company, Global Renewable Energy Partners, PPM Energy, Inc., Altamont Winds Inc., SeaWest Power Resources, LLC, and enXco, Inc. (collectively, the “California Wind Companies”) pursuant to the CEC Notice of Workshop request for public comment dated June 16, 2005, issued as part of the 2005 Integrated Energy Policy Report (Docket No. 04-IEP-1G). These comments are being submitted on July 29, 2005 pursuant to a two-week extension granted by Commissioner John Geesman.

We wish to comment on the content in, and policy options that arise from, the Staff Report entitled *2005 Environmental Performance Report of California’s Electrical Generation System*, CEC-700-2005-016, June 2005 (“EPR”) and CEC Staff Report entitled *Assessment of Avian Mortality from Collisions and Electrocutions*, Dorin and Spiegel, CEC-700-2005-015, June 2005 (“CEC Staff Avian Report”).

In addition to the documents that are made part of this proceeding, published PIER documents, analyses, assessments, technical memos or even verbal or written “opinions” relating to avian mortality issues (collectively “Staff Documents”) have been publicly released without due process before this Commission.¹ The Staff Documents, and the policies and recommendations they contain, have never been subjected to the high standard

¹ The most recent reports were: (1) Smallwood and Spiegel, 2005. *Assessment to Support an Adaptive Management Plan for the APWRA*, California Energy Commission; (2) Smallwood, K. S., and L. Neher. 2004. *Repowering the APWRA: Forecasting and Minimizing Avian Mortality without Significant Loss of Power Generation*. California Energy Commission, PIER Energy-Related Environmental Research. CEC-500-2005-005; (3) Smallwood, K.S. and Linda Spiegel, 2005. *Partial Re-Assessment of an Adaptive Management Plan for the APWRA: Accounting for Turbine Size*. California Energy Commission; and (4) Smallwood and Spiegel, 2005. *Combining Biology-Based and Policy-Based Tiers of Priority for Determining Wind Turbine Relocation/Shutdown to Reduce Bird Fatalities in the APWRA*. California Energy Commission.

of “full and adequate participation by all interested groups and the public at large” that, since the 1970s, have been the hallmark of CEC administrative procedure.²

Our concern arises from one key element: Such documents are gaining the force of CEC policy or rulemaking in the State of California, even though these publications have not undergone the rigors of scientific peer review, public review and comment, or formal adoption by the Commission itself.³

The Use of CEC’s Wind/Avian Information by Stakeholders

Examples of improper reliance on PIER documents that were not subjected to public scrutiny, peer review, and Commission approval procedures are numerous. Statements by permitting authorities, stakeholders, and law enforcement entities demonstrate that Staff Documents, and the recommendations contained within them, are defining the presumed impacts of wind power generation activities on wildlife, and the measures that must be implemented in order to address those impacts:

A. PIER

The 2004 Update to the 2003 IEPR directly encouraged “local permitting agencies for wind projects [to] implement the actions identified in the Energy Commission study to prevent and mitigate bird deaths from wind turbines.”⁴ However, active promotion of the

² California Public Resources Code, §§25222-25224

³ Attachment 1 provides examples of purported California Energy Commission documents that represent a wide range of actual Commission involvement, from formal Commission approval to no Commission involvement at all. Cover pages of these documents are provided in the Attachment.

⁴ CEC, *2004 Integrated Energy Policy Report Update*, p. 42

veracity, authority and use of its own conclusions and recommendations by the PIER staff has occurred. Here are some examples:

In November of 2003, PIER personnel wrote via e-mail (and on California Energy Commission letterhead) to the Alameda County Development Planning Division that the “County is obligated to review” PIER studies and other information. The letter further requested that the County review the CEC’s “scientifically sound information,” and that such a request is “highly appropriate given both the significance of our research to these proposals and the legal requirements of CEQA.” This letter, signed by a PIER wildlife biologist, closed by claiming that “*The Commission* looks forward to a continued cooperative relationship with Alameda County.” [Emphasis added]. See Attachment 2.

On March 4, 2005, following the release of several PIER assessments on the Altamont Pass Wind Resource Area (“APWRA”) that had not undergone a public review process, the Commission’s Executive Director clarified the role of the Staff Documents in his letter to the Alameda County Planning Director: “I would like to make it clear that mitigation measures and goals described in the staff assessment are not official policy of the California Energy Commission or its staff.”⁵ The Director assured Alameda County that “specific permitting conditions, including specific goals in reducing the number of bird deaths and mitigation are under the authority of the permitting agency.” See Attachment 3.

On March 8, 2005, a mere four days later, managers from PIER and the Environmental Office wrote to the Alameda County Planning Director, again on California Energy Commission letterhead, and urged that the County accept at face value the staff

⁵ The “staff assessment” referred to is the *Assessment to Support an Adaptive Management Plan for the APWRA*, Smallwood and Spiegel, January 2005. California Energy Commission. Hereinafter, the “January 2005 Assessment.”

conclusions regarding CEQA, PIER research results, and the PIER recommendations contained therein. See Attachment 4.

B. Other Participants

Other participants are obviously convinced that the California Energy Commission is responsible for publishing rules and recommendations relating to wind farm siting and operation.

The Center for Biological Diversity referred to a study “published by the California Energy Commission in August 2004”, and claimed flatly, in Alameda County Superior Court papers dated February 7, 2005, that (referring to the January 2005 Assessment) “[t]he Energy Commission has now called on [Altamont wind power generators] to reduce their killing by 50% in three years and 85% in six years and to pay millions of dollars per year in restitution....” See Attachment 5.

In another instance, we provide an excerpt from a transcript of discussions between representatives of Kerncrest Audubon Society and Los Angeles Department of Water and Power. This transcript was included as Exhibit A in a Petition for Writ of Mandate filed June 1, 2005 by the Kerncrest and Los Angeles chapters of the National Audubon Society, an action filed in opposition to a wind site near Los Angeles:

Audubon Representative:

You cite a study of birds in Tehacapi [sic] in your report, but fail to include the August 2004 report from the California Energy Commission entitled Developing Methods to Reduce Bird Mortality in the Altamont Pass Wind Resource Area. That four year study makes recommendations for mitigating against avian mortality, especially raptors. Were those recommendations considered in the design of the turbines, towers and lights in the placement of the turbines at the Pine Tree Wind Farm development?

LADWP Consultant:

The California Energy Commission Study was done after my survey.

In the above excerpt, the Petitioner's representative clearly implies that California Energy Commission reports and recommendations should have been used by LADWP's consultant, even though the Petitioner never established that the PIER mitigation recommendations would be applicable to a site hundreds of miles away from the APWRA study location, and would apply at a site where certain songbirds, not raptors, were the primary concern.

C. The California Attorney General

The January 2005 Assessment promoted CEC's "science-founded guidelines," and urged the scientific community to adopt "our [i.e., CEC's] proposed plan."⁶ The PIER Staff's unreviewed recommendations, now revealed to be part of a "*plan*," sought to impose mitigation measures more burdensome than any previous PIER recommendations. This "plan" was later adopted wholesale by the California Attorney General's Office ("AG"). In its July 6, 2005 letter to the Alameda County Board of Supervisors, written just prior to the Board's July 7 consideration of the permits for the APWRA wind projects, the AG confirmed that it is relying primarily on CEC documents, and on discussions with CEC staff and consultants, to support the very forceful recommendations it made to a wind energy site permitting authority. The AG letter is enclosed as Attachment 6.

⁶ *Id.*, p. 2.

The Hazards of Circumventing Public Participation

Although the Warren-Alquist Act does not give this Commission jurisdiction over the siting of wind turbines in California,⁷ PIER reports and recommendations are undeniably, and in many cases, improperly finding their way into wind energy facility permitting requirements. The EPR states, “Statewide guidelines for wind energy projects may be an appropriate way to gain consistency statewide when developing and mitigating projects. Statewide standards could also remove a significant environmental barrier to increasing wind energy in the state.”⁸ This statement can be seen as an attempt to erode the authority of the Counties, and thus deserves a full and adequate review by the public, including all affected permitting authorities, before becoming Commission policy.

It is incumbent upon the Commission to apply the fundamental principles of due process prior to releasing its research and policy recommendations by allowing the open disclosure of publicly-funded research and underlying data, and full and adequate public participation, including peer review. Failing to do so is clearly contrary to the CEC-stated goal of reducing avian impacts “with the least cost to the wind industry.”⁹

An example of the hazards of the Commission’s failure to allow full and adequate public participation and scientific review can be found in the CEC Staff Avian Report regarding bat mortality in Solano County.¹⁰ Monitoring results found therein are reported

⁷ California Public Resources codes, Section 25000, *et seq.*, including Sections 25110, 25119 and Chapter 6 on Power Facility and Site Certification Sections 25500, *et seq.* (in particular, 25502)

⁸ EPR, p. 15.

⁹ Smallwood and Thelander. 2004. *Developing Methods to Reduce Bird Mortality in the Altamont Pass Wind Resource Area*. Final Report by BioResource Consultants to the California Energy Commission, Public Interest Energy Research – Environmental Area, p. 352. (“PIER August 2004 Report”).

¹⁰ CEC Staff Avian Report, p. 22

out of context without reference to the protocols being used. CEC staff fails to mention that a Technical Advisory Committee (TAC) has been reviewing the monitoring activities and results during the past two years. The CEC Staff Avian Report also fails to mention that the results are not unreasonably high for the western United States according to a review of the survey data¹¹. However, the CEC Staff Avian Report immediately jumps to the conclusion that “[m]itigation could include a seasonal shutdown and removal of the highest risk turbines as needed to reduce the impact.”¹²

High Winds is a carefully-sited renewable energy wind project. It operates under permit conditions requiring a complete monitoring and mitigation plan and TAC. High Winds also employs the latest available wind energy generation technology.

The suggestion that seasonal shutdown and removal of turbines could be used as mitigation techniques at High Winds indicates that CEC staff has inappropriately extrapolated information from a single site study, concerning a single location that used different technology, and applied that information to another site without scientific justification. There is no doubt that recommendations such as these can reverberate through the wind industry and can affect future investment in California.

Unsuccessful Efforts to Participate in the Development of CEC Avian Policy

Since 2002, the California Wind Companies have asked PIER staff and its consultants for specific information relating CEC Staff Documents. Scientists working for the California Wind Companies have made numerous data requests and posed several

¹¹ See WEST Comments to the CEC Staff Avian Report, p. 3. Attachment 7.

¹² CEC Staff Avian Report, p. 22.

technical questions to the PIER staff and consultants prior to and after the PIER August 2004 Report was published. The purpose for these inquiries was to support the development of the Altamont Adaptive Management Plan, (AMP, WEST 2005). The primary objective of the AMP is to significantly reduce avian mortality at the APWRA.

Many of these data requests were initially denied, while some were eventually honored. For example, WEST scientists have still not received risk modeling results of turbines that were not characterized during the PIER study; identification of the high-risk turbines in the latest PIER staff report; and a complete data set necessary to determine specific baseline fatality rates and the associated uncertainty.

We have not, for the most part, received specific nor timely answers from PIER in response to our requests. In response, only successive written reports and assessments, each containing new conclusions and recommendations were issued outside of a formal protocol.¹³ If the PIER staff continues to circumvent public participation, it will be difficult to verify the accomplishment of their stated goal of reducing avian impacts “with the least cost to the wind industry.”¹⁴

Improving CEC Procedures

The Energy Commission has over 30 years of experience in balancing the often competing energy, environmental, and economic interests involved in producing a coherent energy policy for the people of California. We urge the Commission to ensure that its staff and research contractors adhere to these high standards and traditions as well. The

¹³ See works cited in Footnote 1, *supra*.

¹⁴ Footnote 9, *op. cit.*

Commission should insist that all staff clearly distinguish policy recommendations from scientific research and publications, and distinguish Commission-adopted policy from staff positions.

Although CEC Staff Documents purport to generally involve environmental research, policy statements and recommendations have been made within these papers that clearly fall within the realm of energy production and economics. We encourage the CEC to enlist qualified experts in these disciplines to conduct peer-reviewed research and contribute to policy and recommendations proposed by the CEC staff. Such experts should also be made available to defend their contributions in a public process. The Commission must develop appropriate procedures for both scientific peer review and public participation within PIER, and continue its public review of policy in proceedings such as this.

We are not requesting that the Commission cease its longstanding tradition of innovative and advanced research on matters relating to energy generation, including the environmental impacts of wind generation. Rather, we are requesting that all stakeholders have the opportunity to review and have input into Commission-funded PIER and other research, policy, or regulatory guidance that involves the siting and operation of wind energy facilities. Such a collaborative effort would reduce the likelihood that the California Wind Companies will be required to operate with unnecessary or unjustified costs, conditions, or limitations.

SPECIFIC COMMENTS ON THE EPR AND STAFF AVIAN REPORT

The California Wind Companies appreciate the opportunity for comment as part of this IEPR process.

A comprehensive technical critique of the CEC Staff Avian Report is provided as Attachment 7. There are many issues that require further discussion in a public forum before the Commission can sanction the use of that Report. Among WEST's most notable concerns are their disagreement with the statistical methods and assumptions used, and the subsequent results obtained from them. For example, the methods used to calculate baseline fatality data are based on searches conducted approximately once every 50 to 90 days, when most searches are conducted on intervals of 30 days or less when the objective is to estimate fatality rates. Also, WEST notes the inconsistencies in raptor mortality estimates in the August 2004 CEC staff report itself, which vary by as much as 50 to 90%.

We provide, as Attachment 8, a discussion of the proper elements of scientific peer review and public participation that should be useful in assisting the Commission with the development of scientific review protocols consistent with California law.

We have also included separate comments on the EPR. See Attachment 9. Our comments indicate areas which require modification by the Commission prior to adoption of the IEPR. Additionally, we reiterate our request for a full and comprehensive peer and public review of all the underlying Staff Documents.

CONCLUSIONS AND RECOMMENDATIONS

The California Wind Companies are committed to working collaboratively with the PIER staff to develop criteria by which the scientific results of the CEC research may be disseminated for public consumption.

Therefore, we recommend that the Commission adopt the following principles as part of the IEPR policies:

1. Wind generation is a critical element of California's renewable energy, economic, and climate change policies and any Commission recommended avian measures must consider the impact on generation;
2. The APRWA is a unique wind and open land resource that may require unique mitigation measures due to the pioneering generation technology that exists today, the large numbers of migratory birds who utilize that area and the special terrain. Thus avian mortality reduction measures applicable in the APRWA are not directly transferable to any other wind resource area in California without further scientific analysis;
3. Through a collaborative process with all stakeholders, the Commission will establish and adopt peer and public review process for any scientific research in the PIER program, performed on the environmental impacts of wind generation in California. No staff report may be issued or released under the CEC name until these new processes are followed -- including Commission approval where appropriate;
4. New wind turbine technology, including repowering of California's pioneer technology fleet, currently appears to represent a primary means of reducing wildlife impacts;
5. Energy production and economics experts within CEC should be allowed to collaborate on environmental research when appropriate and necessary to fulfill CEC goals of reducing avian fatalities while fostering the production of wind energy at the least cost to the wind industry;
6. Economic issues associated with the avian impacts due to the operation of new generation turbines, with its significant capital investment, require appropriate pricing policies by the CPUC; and

7. Full public access to all data and information behind publicly-funded research by the CEC staff, including the Staff Documents. This would include the immediate release of the APWRA data underlying the August 2004 PIER Report.

In conclusion, the California Wind Companies recognize the CEC and PIER program role in conducting and funding avian impact assessments. We welcome research that quantifies the biological impacts of wind energy production and designs management measures for those impacts compatible with allowing wind generation to meet California's renewable energy policy goals. We further support CEC-funded research for independent evaluation of the effectiveness of such measures based on actual experience with operating wind turbines. To improve the quality and usefulness of this research, procedures should be created by the CEC to accommodate peer review, public participation, and closer collaboration with other state and national experts. Implementation of these procedures will serve to improve the quality and useful application of CEC's research in permitting venues, while addressing the issue of unauthorized staff advocacy.

We appreciate CEC's efforts to review these comments. We welcome the opportunity to work with the Commission and its staff to successfully implement our recommendations. Please contact Diane Fellman at 415-703-6000 or email her at diane_fellman@fpl.com if you have any questions concerning these California Wind Companies' Reply Comments.

ATTACHMENT 1

Overview of California Energy Commission Work Products and Procedures

Level of Approval	Example	Outline of Process
Decision of the full five member Commission	"2004 Update to 2003 IEPR"	Adoption by majority vote of full five-member commission in a duly noticed public meeting pursuant to a motion of a member of the Commission, which may be based on the recommendations of a Commission Committee or staff. Proceedings that are adjudicatory or rule-making in nature also involve specific procedures for notice, taking of evidence, and public review and comment.
Decision of two member Commission Committees	"Committee Final Report 2004 Update to 2003 IEPR"	Committee report based on extensive public hearings by Committee, staff workshops, opportunities for public comment. Most Committee decisions are not final until adopted by the full Commission.
Official Statement of Position by Staff	March 4, 2005 letter from the CEC Executive Director to the Alameda County Planning Director, stating "...I would like to make it clear that the mitigation measures and goals described in the [19 January 2005] staff assessment are not official policy of the California Energy Commission or its staff."	Statements of staff position can be issued by the Executive Director on policy matters. Statements of staff position in rulemaking or adjudicatory proceedings are governed by the rules of practices and procedures adopted by the CEC for such proceedings.
Staff Report published as an official Staff Report	"Assessment of Avian Mortality from Collisions and Electrocutations" – Staff Report CEC 700-2005-015, June 2005	Official Staff Report released for review in a public proceeding. Carries CEC Report number and includes disclaimer that "Neither the State of California, the California Energy Commission, nor any of their employees, contractors or subcontractors, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness or usefulness of any information, apparatus, product or process enclosed, or represents that its use would not infringe on privately owned rights."
Consultant Report published by the CEC as an official work product of the PIER or other program	"Developing Methods to Reduce Bird Mortality in he Altamont Pass Wind Resource Area" PIER Final Project Report, August 2004, P500-04-052	Consultant Report funded by the CEC and reviewed by staff to a degree sufficient in this case to be issued as a PIER Final Project Report. Such issuance does not necessarily involve peer review of the sort required for publication in a refereed scientific journal. Nor does it imply that the report has undergone any public review prior to publication. The Report carries the disclaimer that: "This report was prepared as the result of work sponsored by the California

Staff or consultant memo released under their own recognizance.		<p>Energy Commission. It does not necessarily represent the views of the Energy Commission, its employees or the State of California. The Energy Commission, its employees, contractors or subcontractors make no warrant, express or implied, and assume no legal liability for the information in this report, nor does any party represent that the uses of this information will not infringe upon privately owned rights. This report has not been approved by the California Energy Commission nor has the California Energy Commission passed upon the accuracy or adequacy of the information in this report.”</p>
Staff or consultant memo released under their own recognizance.	<p>“Assessment to Support an Adaptive Management Plan for the APWRA,” Shawn Smallwood and Linda Spiegel, California Energy Commission January 19, 2005”</p>	<p>A staff memo in this case co-authored by a consultant to the CEC, who is not identified as such. There is no apparent procedure for controlling release of such documents by staff to stakeholders and the public. No disclaimers are contained in the document that would indicate what, if any review or approval it had internally or in a public forum. On the contrary, it contains the following text: “The CEC suggests that the 50% reduction based on the mortality levels reported in Smallwood and Thelander (2004, Table 3-10) should be achieved within three years,¹ using the following recommended prescriptions. At that time the efficacy of the prescriptions should be assessed, and if necessary alternative prescriptions should be implemented to achieve an 85% reduction in mortality within the next three years (over a total time span of six years of treatments).” (Emphasis in the original.) This statement clearly represents that the “suggestion” that a goal of 50% reduction in three years and 85% reduction in six years has been sponsored by the “CEC” itself.</p>
Staff advice to the Office of the Attorney General	<p>July 6, 2005 Letter from the Office of the Attorney General to the Alameda County Board of Supervisors</p>	<p>CEC staff is providing advice to the Attorney General’s Office in support of CEC staff recommendations to the Alameda County Board of Supervisors considering the appeal of the Altamont conditional use permits. While it is normal for State agency staffs to communicate with local governments on matters within their respective areas of expertise or responsibility, the Attorney General’s Office heavily relied upon information and recommendations provided by CEC staff and consultant documents that were subject to little or no formal review, and which contained policy statements related to economics and electric power generation that were offered with inadequate supporting research or documentation.</p>

INTEGRATED ENERGY POLICY REPORT

2004 Update

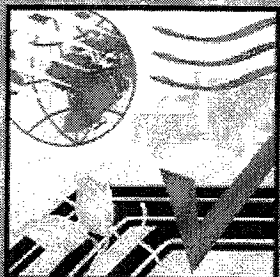
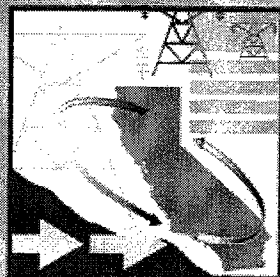
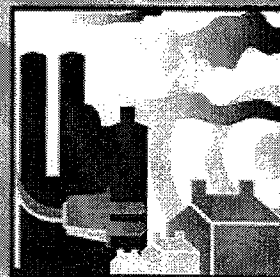
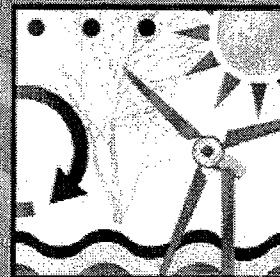


Governor
Arnold Schwarzenegger

**CALIFORNIA
ENERGY
COMMISSION**

NOVEMBER 2004

100-04-006CM



COMMITTEE FINAL REPORT

INTEGRATED

ENERGY POLICY REPORT

2004 Update

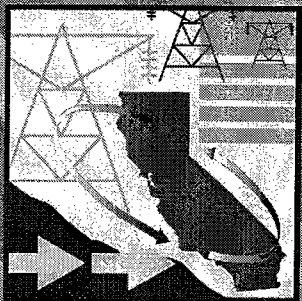
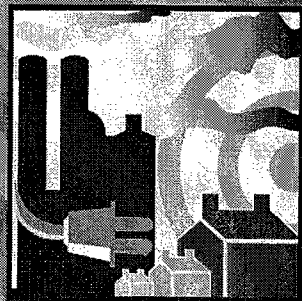
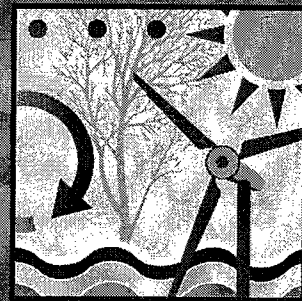


Governor
Arnold Schwarzenegger

**CALIFORNIA
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OCTOBER 2004

100-04-006CTF



CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov



March 4, 2005

Chris Bazar
Planning Director
Department of Community Development
Alameda County
224 West Winton Ave, Room 110
Hayward, CA 94544

Dear Mr. Bazar:

I am writing to clarify the position of the California Energy Commission relative to ongoing operations and re-powering as they relate to avian mortality issues at the Altamont Pass Wind Resource Area (APWRA).

As you are aware, Alameda County staff formed a technical working group to assist in developing alternatives to address the avian issue and facilitate re-issuing operating permits in the APWRA. This group is known as the Alameda County Wind Power Working Group. At the request of the working group, Energy Commission staff recently provided an assessment¹ of the wind Industries December 2004² plan to address avian impacts from collisions with wind turbines. The industry plan recommended a strategy to permanently and seasonally shut down problematic turbines.

The purpose of the staff assessment was to use a risk model developed by the Energy Commission to estimate what effect the actions in the proposed plan would have on reducing avian fatalities. The assessment also provided an assessment of alternatives as a key to setting goals and performance standards as requested by the County of Alameda Planning Director, the appellants to a pending lawsuit against APWRA operators, and other stakeholders.

The staff assessment provided all interested parties with critical information necessary to facilitate the ongoing discussions of the working group and negotiations between the turbine owners, Alameda County and the appellants. However, I would like to make it clear that the mitigation measures and goals described in the staff assessment are not official policy of the California Energy Commission or its staff.

¹ Assessment to Support an Adaptive Management Plan for the APWRA, Smallwood and Spiegel, January 2005

² Avian Collision and Electrocution Risk Reduction Draft Management Plan for the Altamont Pass Wind Resource Area, Erickson and Strickland, December 2004

Mr. Chris Bazar
March 4, 2005
Page 2

The Energy Commission is dedicated to ensuring safe, reliable, and affordable energy supplies to California in a manner that encourages environmental protection and economic growth. Meeting this demand involves diversifying the energy sources and offering consumers choices of energy supplies. Promoting wind energy development in the state is key to meeting these strategies and the goals of the Renewable Portfolio Standards. The Energy Commission's commitment to promoting wind energy development is clearly stated in our recent policy reports, *The 2003 Integrated Energy Policy Report (IEPR)* and the *2004 Update*³, which represents the foundation for State energy policy.

The *2004 Update* explicitly addresses renewable energy, including the need to increase wind development. In that document, avian collisions with wind turbines are identified as a barrier to re-powering aging facilities and promoting new, more efficient wind development. The policy recommendations in the 2004 IEPR Update explicitly support re-powering and suggest local permitting agencies implement the actions identified in the Energy Commission research to prevent and mitigate bird deaths from wind turbines (pages 41 and 42, 2004 Update).

Staff's research results and current involvement with the Alameda County's Wind Power Working Group shows a commitment to meeting these recommendations and ensuring the promotion of further development of wind energy resources in the State. However, specific permitting conditions, including specific goals in reducing the number of bird deaths and mitigation are under the authority of the permitting agency. The Energy Commission will continue to play a supporting role as requested by the County.

The Energy Commission looks forward to working with the County in its pursuit to develop affordable, diverse and environmentally benign renewable energy resources.

Sincerely,

original signed by

ROBERT L. THERKELSEN
Executive Director

³ 2003 Integrated Energy Policy Report, CEC 2003, 100-03-019 and Integrated Energy Policy Report 2004 Update, 100-04-006CM

CALIFORNIA
ENERGY
COMMISSION

ASSESSMENT OF AVIAN MORTALITY FROM COLLISIONS AND ELECTROCUTIONS

STAFF REPORT

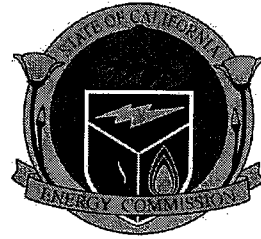
In Support of the
2005 Environmental Performance Report and the
2005 Integrated Energy Policy Report Proceeding
(Docket 04-IEP-1)

JUNE 2005
CEC-700-2005-015



Arnold Schwarzenegger, Governor

DEVELOPING METHODS TO REDUCE BIRD MORTALITY IN THE ALTAMONT PASS WIND RESOURCE AREA



Arnold Schwarzenegger
Governor



Prepared For:
California Energy Commission
Public Interest Energy Research Program

Prepared By:
BioResource Consultants

PIER Final Project Report

August 2004
500-04-052

ASSESSMENT TO SUPPORT AN ADAPTIVE MANAGEMENT PLAN FOR THE APWRA

Shawn Smallwood and Linda Spiegel, California Energy Commission

19 January 2005

The following mitigation plan for the APWRA is intended to support the early efforts by WEST, Inc to develop viable measures to reduce avian mortality in the APWRA. Herein we provide foundation for the WEST Inc mitigation suggestions with our data based on the NREL/CEC research results published in the CEC final report (Smallwood and Thelander 2004), as well as additional research published by CEC recently (Smallwood and Neher 2005). It also is based on additional analysis and interpretation of data used in these reports, but yet to be published. It is important to note that our assessment is based on 4,074 of the turbines we have necessary information on and does not account for the additional 1,085 turbines that we do not.

The CEC has stated that the mitigation measures in the WEST, Inc December 2004 plan must be justified by scientific information to illustrate that they will in fact result in acceptable levels of reduction in bird fatalities before each can be adopted by the stakeholders. Scientific justification is needed for the ten percent relocation/decommissioning cap, the percentage of turbines shut down seasonally, and the ratios for off-site compensation proposed. These caps appeared to be financially-founded rather than science-founded, and they lacked any relationship to an overall effect. Therefore, the CEC performed preliminary analyses toward using the best science available to quantify and justify the number of turbines that should be removed or seasonally shut down and to estimate more precisely what effect these actions would have on reducing fatalities.

Our assessment indicates that at least 7 to 16% of existing turbines in the APWRA should be permanently shut down and 43 to 100% of them should be seasonally shut down to achieve a desired reduction in bird fatalities. We predict that a permanent shut down of 7% of the turbines could lead to fatality reductions of the four targeted raptor species from 17% to 29% depending on the species, whereas a 16% shut down could lead to 28% to 64% reductions. A winter-time shutdown of all turbines could lead to a 29% to 47% decrease in total fatalities or a 20 % to 45% decrease in fatalities per kWh/year for targeted species, and a fall and winter shutdown could lead to a 44% to 59% decrease in total fatalities or a 17 % to 39% decrease in fatalities per kWh/year for targeted species. Though not entirely additive, implementing both of these measures would lead to a greater reduction in fatality than what is predicted for each measure individually. Permanent shut down of 16% of the 4,074 turbines would remove 89 MW of rated capacity. Seasonal shut down of all turbines during fall and winter would amount to a loss of about 32% of annual power output, whereas shut down during winter only would result in a loss of about 16.4% of annual output.

We also propose that more effort be dedicated to measures that reduce the potential to attract raptors close to the turbines, and we provide a contingency plan that recommends measures to be taken immediately and others to be taken in the event acceptable levels in bird fatalities are not

BILL LOCKYER
Attorney General

State of California
DEPARTMENT OF JUSTICE



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July 6, 2005

Alameda County Board of Supervisors
1221 Oak Street, Suite 536
Oakland, CA 94612

RE: Appeal by the Californians for Renewable Energy, Inc., the Center for Biological Diversity and the Golden Gate Audubon Society Regarding the Conditional Use Permits for the Maintenance and Operations of Existing Wind Turbines in the Altamont Pass Wind Resources Area

Dear Honorable Board Members:

We submit the following comments for your consideration in determining whether, and on what conditions, to renew the conditional use permits (CUPs) for the wind turbines currently operating in the Alameda County region of the Altamont Pass Wind Resources Area (APWRA). We appreciate your efforts to ensure that the CUPs, if renewed, will be conditioned to reduce the ongoing bird mortalities at the APWRA.

At issue are the steps government should take to balance protection of bird species, particularly raptors, and energy production. Scientific research sponsored by the California Energy Commission (CEC) has shown that the APWRA turbines kill between 1,766-4,721 birds annually. Of that number, between 881-1,300 are raptors such as golden eagles, hawks, falcons and owls. Since the project began operation, the CEC estimates that between 17,000-26,000 raptors have been killed by the turbines. The APWRA is an important raptor area because it has high densities of breeding populations, and is both a bird wintering area and a major migratory route. To date, the wind companies have implemented few mitigation measures to reduce these ongoing bird mortalities. Yet, there are ways technically and economically to continue to operate the turbines and at the same time significantly reduce their impacts.

As background, our office and the Alameda County District Attorney's Office became involved in these issues at the invitation of Judge Ronald Sabraw of the Alameda County Superior Court in relation to a suit filed by one of the appellants, *Center for Biological Diversity v. FPL Group*, Case No. RG04183113. As part of our investigation to decide whether to intervene in that lawsuit, we met with the appellants, Chris Bazar of the Alameda County Planning Department, and twice with representatives of the wind companies. We have been closely coordinating this effort with the U.S. Attorney's Office and the Alameda County District

Attorney's Office. We also have consulted with an expert studying avian mortality at the APWRA, Shawn Smallwood, as well as staff at the CEC, Linda Spiegel, and staff at the California Department of Fish and Game and the U.S. Fish and Wildlife Service. From the outset, it became clear that the current operation of the turbines at the APWRA presents a significant problem with extremely high levels of bird mortality. After our most recent meeting with the wind companies on June 23, 2005, we have determined that the current proposal from the wind companies in the working group process does not do enough to reduce bird mortalities, and is deficient in a number of respects, as outlined below.

The wind companies propose to reduce avian mortality by certain percentages in the first three years (25% in year one, 30% in year two, and 35% in year three), through implementation of a partial winter shutdown and a permanent shutdown of 2% of the high risk turbines (about 100 turbines). Not only are these low target goals, but the measures proposed by the companies to accomplish the goals lack scientifically-sound study designs to ensure reliable bird mortality data.

The companies also have proposed to monitor only some of the turbines repowered to date to determine whether to repower additional turbines beginning in year four. The companies will only "consider" the removal of high risk turbines in developing repowering projects. In year four, if they do not repower, they will aim for a 40% in reduction of bird mortalities in year four and a 45% in reduction in year five, again low target goals. The companies will await the completion of the County's environmental impact report (EIR) to identify off-site mitigation, as well as other specific measures to mitigate avian mortality. As indicated in their February 2005 plan, all performance standards, goals and mitigation measures can be changed, and the wind companies can "opt out" of the plan due to an unacceptable financial hardship. Monitoring is contingent on the companies obtaining CEC funding. The companies have retrofitted some electrical lines, and will consider retrofitting additional lines only when problems arise. They will move the derelict turbines and the rock piles, but it is unclear when this will occur.

In our view, this proposal does not go far enough in mitigating the serious ongoing impacts of these operations. Relying on the best available science resulting from years of study sponsored by the CEC and others, we have concluded that the mitigation measures proposed in the CEC's August 2004 consultant report and the Smallwood and Spiegel January and June 2005 assessments present the best opportunity to reduce avian mortality, while at the same allowing for the continued economic viability of the production of wind energy at the APWRA.¹ Specifically, we recommend inclusion of the following as conditions to the permit, which we have previously communicated to the wind companies:

1. Beginning in year one, permanently shut down the turbines in Tiers 1-3 (as

¹We base our statement of economic viability upon a review of publicly-available documents in the absence of the companies providing financial information, which we have requested several times.

identified in the June 2005 Smallwood and Spiegel assessment) which are the worst offending turbines (this amounts to about 300 turbines). In combination with this, seasonally shut down 100% of the existing turbines in the winter months (November 15 to February 28) in all years. This period is at a time of high bird use but low energy demand. Based on an assessment by Smallwood, these shutdowns will achieve an estimated 50% reduction in raptor mortality, but will impact power production by only 17.5%.

2. The EIR, which is to be finalized by the end of year three, should assess the environmental impacts of both repowering and the existing facilities. A range of mitigation measures should be explored in addition to repowering, especially considering that if repowering occurs it will be phased in over the remaining ten years of the permits.
3. In year four, repower by removing high risk turbines or implement further mitigation measures to achieve an 85% reduction in mortality by year six.
4. Beginning immediately, implement other measures identified in the CEC August 2004 report to the extent that they have not already been adopted. These include: retrofitting all electrical lines, removing derelict turbines, and relocating rock piles away from the turbines.
5. Immediately implement off-site mitigation. The off-site mitigation must be sufficient to compensate for past harm as well as for future mortality associated with the existing and repowered turbines. Off-site mitigation could be achieved through purchase of easements to protect bird habitat for breeding and foraging, to compensate for the bird mortality that has gone unchecked for the last twenty years.
6. The wind companies should be required to pay for a neutral expert, to be selected by the County, to sit on the scientific review panel and monitoring team and to advise the County.
7. Monitoring, to be funded by the wind companies, should be required in all years and should consist of a statistically-defensible design that can reliably detect changes.
8. Finally, there should be no opt-out provisions in the permit.

We also have some concerns about the County's compliance with the California Environmental Quality Act (CEQA). We understand that the County is not preparing an EIR concurrent with the proposed renewal of the CUPs, but rather that it will prepare an EIR over the next three years. Since the impacts of the existing facilities at the APWRA have not previously

been analyzed and circulated for public review and comment in a prior EIR, we have some concerns about this approach. However, if the proposed EIR analyzes both the impacts of repowering and the impacts from the existing wind turbines and other facilities, with a goal of identifying a range of potential alternative mitigation measures to address all of those impacts, this would go a long way towards alleviating our concerns.

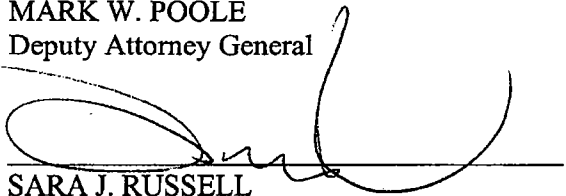
Finally, we have some concerns that the decision to issue the CUPs may be made without the benefit of even basic financial data reflecting the various wind companies' assertions of inability to pay for mitigation. We have been informed that this financial information has not been provided to the County. As part of our ongoing investigation of this matter, we have requested audited financial statements, financial filings with government regulators and other financial information on several occasions. However, to date no such information has been provided. Our concern is that the County may approve the CUPs and require less mitigation than that proposed by the CEC August 2004 report and the subsequent assessments by Smallwood and Spiegel, based on unsupported assertions of economic infeasibility, and without any opportunity to review evidence of each company's ability to pay. Our own review of publicly-available information indicates that a 17.5% loss in energy production due to implementation of the measures described above should not create a significant financial hardship for the wind companies.

In summary, the ongoing harm to protected bird species at the APWRA is serious and unacceptable. While we support the development of wind energy, wind production must be pursued in a manner that minimizes bird loss. Fortunately, significant reductions in avian mortality can be achieved in an economically-feasible manner. However, these measures must be implemented immediately to significantly reduce the ongoing impacts of the continued operation of the APWRA on bird populations. Because the APWRA is the largest of its kind in the world, what happens here could set an important precedent for how these issues are addressed elsewhere in California and the United States. We appreciate your efforts to address these difficult issues, and the opportunity to express our views.

Sincerely,

BILL LOCKYER
Attorney General of the State of California
TARA L. MUELLER
Deputy Attorney General
MARK W. POOLE
Deputy Attorney General

By:


SARA J. RUSSELL
Supervising Deputy Attorney General

cc: Chris Bazar, Alameda County Planning Director
Thomas J. Orloff, District Attorney
Christopher G. Carpenter, Assistant District Attorney
Stacey Geis, Assistant U.S. Attorney
Daniel Crum, U.S. Fish and Wildlife Service
Linda Spiegel, California Energy Commission
Janice Gann, Department of Fish and Game
Shawn Smallwood, Ph.D.
Counsel for the Wind Companies
Counsel for the Appellants

ATTACHMENT 2

CALIFORNIA ENERGY COMMISSION1516 NINTH STREET
SACRAMENTO, CA 95814-5512

Andrew N. Young
Development Planning Division
Alameda County Community Development Agency
224 W. Winton Ave.
Hayward, CA 94544

November 13, 2003

RE: Proposed CUP renewals for wind turbines at the Altamont Pass Resource Area

Dear Mr. Young:

This letter is in response to notifications, dated October 31 and November 4, 2003, the Energy Commission received on the proposed re-issuance from "various applications" of conditional use permits (CUPs) for the maintenance and operations of existing wind turbines in the Altamont Pass Wind Resources Area (APWRA). The Energy Commission has sponsored research on avian fatalities from collision with wind turbines in the APWRA since 1986, and is currently preparing a report and risk prediction model specific to a five-year research project at APWRA, focused on understanding factors responsible for collision risk and suggested management practices to reduce that risk. Preliminary findings have been shared with your agency, U.S. Fish and Wildlife Service, and wind turbine operators at the APWRA. A draft of that report is expected to be released in December 2003.

The County's notifications state that the proposals to re-issue CUP's are Categorically Exempt from the California Environmental Quality Act and is basing that justification, in part, from an Environmental Impact Report (EIR) prepared in 1998. However, given the breadth of new information available on the extent of, and factors related to, the occurrence of bird fatalities from striking turbine blades in the APWRA since the CUP's were issued 20 years ago, I believe that the County is obligated to review this current and very pertinent information before re-issuing these permits.

The 1998 EIR noted that avian fatalities were a significant adverse and unmitigated impact. We now know that at least 1,080 birds, mostly raptors and nearly all species protected under the Migratory Bird Treaty Act, are killed annually from collisions with wind turbines at the APWRA. Under this Act, there are no provisions for take, yet no mitigation measures have been enacted that show a reduction in the incidence of fatalities. Additionally, a rodent control program initiated there was not addressed in the 1998 EIR, has negative impact implications for several other species of concern at the APWRA, and has in fact been shown to greatly increase collision risk for some species, including the burrowing owl and red-tailed hawk.

The Energy Commission supports the expansion of wind energy and other renewable energy sources in the state, but has consistently maintained that this must be done in an environmentally responsible manner. The Energy Commission's Public Interest Energy Research Program has funded millions of dollars in research projects to promote development, improve technology, and understand how to reduce the risk of bird collisions. We understand the economic hardship the wind industry has experienced in the current energy market and have devoted funds for the avian research without matching funds from the industry. We have through a series of meetings with

APWRA operators over the last two years, coordinated our research, shared preliminary findings, and suggested potential interim mitigation measures until our findings were complete and finalized. It is our intention to develop the risk assessment model to help the industry reduce the numbers of bird fatalities and we have, after years of scientifically rigorous data collection and analyses, identified a series of topographical, turbine, design, and land management features that if incorporated into future planning efforts will significantly reduce bird collisions at APWRA.

As stated above, the risk assessment model and final report are scheduled to be completed in December 2003. The Energy Commission will provide if deemed necessary, any preliminary results we have to date. We respectfully request that the review of the several applicants for re-issuing the CUP's at the APWRA take into account our years of scientifically sound information, as well as information that has been made available since the issuance of the initial CUP's, before approving these applications. This request is highly appropriate given both the significance of our research to these proposals and the legal requirements of CEQA.

Thank you for the opportunity to comment. The Commission looks forward to a continued cooperative relationship with Alameda County.

Sincerely,

Linda Spiegel
Energy Commission Specialist II – Wildlife Biologist
Public Interest Energy Research

ATTACHMENT 3

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov



March 4, 2005

Chris Bazar
Planning Director
Department of Community Development
Alameda County
224 West Winton Ave, Room 110
Hayward, CA 94544

Dear Mr. Bazar:

I am writing to clarify the position of the California Energy Commission relative to ongoing operations and re-powering as they relate to avian mortality issues at the Altamont Pass Wind Resource Area (APWRA).

As you are aware, Alameda County staff formed a technical working group to assist in developing alternatives to address the avian issue and facilitate re-issuing operating permits in the APWRA. This group is known as the Alameda County Wind Power Working Group. At the request of the working group, Energy Commission staff recently provided an assessment¹ of the wind Industries December 2004² plan to address avian impacts from collisions with wind turbines. The industry plan recommended a strategy to permanently and seasonally shut down problematic turbines.

The purpose of the staff assessment was to use a risk model developed by the Energy Commission to estimate what effect the actions in the proposed plan would have on reducing avian fatalities. The assessment also provided an assessment of alternatives as a key to setting goals and performance standards as requested by the County of Alameda Planning Director, the appellants to a pending lawsuit against APWRA operators, and other stakeholders.

The staff assessment provided all interested parties with critical information necessary to facilitate the ongoing discussions of the working group and negotiations between the turbine owners, Alameda County and the appellants. However, I would like to make it clear that the mitigation measures and goals described in the staff assessment are not official policy of the California Energy Commission or its staff.

¹ Assessment to Support an Adaptive Management Plan for the APWRA, Smallwood and Spiegel, January 2005

² Avian Collision and Electrocution Risk Reduction Draft Management Plan for the Altamont Pass Wind Resource Area, Erickson and Strickland, December 2004

Mr. Chris Bazar
March 4, 2005
Page 2

The Energy Commission is dedicated to ensuring safe, reliable, and affordable energy supplies to California in a manner that encourages environmental protection and economic growth. Meeting this demand involves diversifying the energy sources and offering consumers choices of energy supplies. Promoting wind energy development in the state is key to meeting these strategies and the goals of the Renewable Portfolio Standards. The Energy Commission's commitment to promoting wind energy development is clearly stated in our recent policy reports, *The 2003 Integrated Energy Policy Report (IEPR)* and the *2004 Update*³, which represents the foundation for State energy policy.

The *2004 Update* explicitly addresses renewable energy, including the need to increase wind development. In that document, avian collisions with wind turbines are identified as a barrier to re-powering aging facilities and promoting new, more efficient wind development. The policy recommendations in the 2004 IEPR Update explicitly support re-powering and suggest local permitting agencies implement the actions identified in the Energy Commission research to prevent and mitigate bird deaths from wind turbines (pages 41 and 42, 2004 Update).

Staff's research results and current involvement with the Alameda County's Wind Power Working Group shows a commitment to meeting these recommendations and ensuring the promotion of further development of wind energy resources in the State. However, specific permitting conditions, including specific goals in reducing the number of bird deaths and mitigation are under the authority of the permitting agency. The Energy Commission will continue to play a supporting role as requested by the County.

The Energy Commission looks forward to working with the County in its pursuit to develop affordable, diverse and environmentally benign renewable energy resources.

Sincerely,

original signed by

ROBERT L. THERKELSEN
Executive Director

³ 2003 Integrated Energy Policy Report, CEC 2003, 100-03-019 and Integrated Energy Policy Report 2004 Update, 100-04-006CM

ATTACHMENT 4

CALIFORNIA ENERGY COMMISSION

1516 NINTH STREET
SACRAMENTO, CA 95814-5512
www.energy.ca.gov



March 8, 2005

To: Chris Bazar
Planning Director
Department of Community Development
Alameda County
224 West Winton Ave, Room 110
Hayward, CA 94544

Dear Mr. Bazar,

As requested at the recent Wind Power Working Group meeting, this letter provides comments on the February 2005 Industry Plan, "Avian Collision and Electrocution Risk Reduction Adaptive Management Plan for the Altamont Pass Wind Resource Area".

The February Plan differs from the industry's December 2004 Plan in that it proposes seasonal shutdown of half the turbines during the first two months of winter and the other half during the last two months of winter in addition to relocating 100 high risk turbines. The earlier December Plan proposed the seasonal shutdown of up to 100% of the existing turbines during winter or to permanently shut down or relocate 10% (500) of the existing turbines.

Before commenting on the plan we would like to clarify some misperceptions about our assessment of the December 2004 plan. This assessment does not represent Energy Commission policy and is not an official Energy Commission published report. Therefore, it should not be cited as such. We believe that our analysis provides important information that can facilitate negotiations between the turbine owners, Alameda County and the appellants. Energy Commission staff used an extensive data base and risk assessment model developed for the Altamont Pass Wind Resource Area. This model was used to identify high risk turbines that are candidates for shutdown, as well as the effect permanent and seasonal shutdown would have on reducing bird fatalities. Additionally, the offsite mitigation formulae are instructional only, and the numbers used in the formulae were not intended as recommendations. This was clear in the text preceding the formulae, as was the need for the owners, the County, and the appellants to negotiate this issue.

Mr. Chris Bazar

3/8/2005

Page 2

Review Comments on the February 2005 Avian Collision and Electrocution Risk Reduction Adaptive Management Plan for the APWRA

The February 2005 Plan lacks the detail necessary to warrant specific comments on study design, but we'd like to offer the following points for your consideration.

Adaptive Management is portrayed as simple trial and error. As such, performance standards, goals, objectives, and mitigation measures can be changed at any time, mainly at the discretion of the owners. True adaptive management requires a commitment to explicit goals and objectives. These do not change. Additionally, detailed mitigation measures and contingent alternative measures are specific and agreed to upfront. Under CEQA, project applicants and lead agencies cannot defer formulation of the mitigation to later, unspecified dates (Guidelines 15126.4). Therefore, we recommend developing all mitigation, alternative mitigation (contingencies), and off-site compensation before issuing a permit.

There are several statements indicating that an owner can opt out of the plan or change objectives at any time if implementing the measures is deemed an unacceptable financial burden. The plan is therefore not binding. Whereas CEQA allows for a finding that "specific economic, social or other conditions make infeasible the mitigation measures or project alternatives identified in the final EIR", all such findings must be supported by substantial evidence in the record (Guidelines 15091 (a)(3)).

Determining the annual success of reaching the goal of attaining 25%, 30%, and 35% reductions in combined mortality over year one, two and three respectively, will be difficult due to inter-annual variation and small sample size. The goals should be stated as a minimum and should encourage greater reductions of fatalities through mitigation measures. This adaptive management plan does not include long term reduction goals, yet for adaptive management to be successful the long term goals should be outlined, while how you get there may be adapted to new knowledge of mitigation measures.

The plan states that the owners can modify the plan if the US Fish and Wildlife Service (USFWS) and the County do not respond to a notice to do so within a 30-day period. This time frame appears unrealistic given the lead time always needed by the USFWS. Modification to the plan should also require input from a Scientific Review Committee (SRC).

The plan states that an SRC will develop possible off-site compensation recommendations to compensate for "significant bird mortality remaining after implementation of the management strategies". Will this take into account the 75% to 65% mortality that will continue even if the stated yearly goal is met? Will it be retroactive to include the remaining mortality incurred during year one through three?

The evaluation of rodent control will concentrate more on golden eagles, yet red-tailed hawks and burrowing owls were the species identified as being negatively effected by the rodent control program. Therefore, we recommend these species also be monitored.

Mr. Chris Bazar
3/8/2005
Page 3

Since only half of the 800 – 1000 turbines proposed for seasonal shut down will be monitored at any one time, the sample size and time span is really 400-500 per 2 months for each treatment ($\frac{1}{2}$ the turbines). This level of monitoring will result in a sample size that is likely too small to show whether the mitigation is successful on a large scale.

To help understand how the proposed seasonal shut down equates to the assessment by Smallwood and Spiegel (2004) and assuming that fatalities are uniformly distributed throughout the winter, mortality estimates from seasonal shutdown of $\frac{1}{2}$ the turbines can be estimated by multiplying Smallwood and Spiegel estimates by 0.5. Thus estimates of reduced annual fatalities are 22% for golden eagle, 29.5% for red-tailed hawk, 28.5% for American kestrel, 23.5% for burrowing owl, and 26% for all raptors. Combined mortality reduction for golden eagle, red-tailed hawk, and burrowing owl is estimated to be about 25.7%.

To help understand how the proposed temporary shutdown or relocation of 100 selected turbines equates to the assessment by Smallwood and Spiegel (2004) and assuming the selected turbines compose a random subset of identified Tier 1 and 2 turbines, the effectiveness of this measure can be estimated by multiplying the 100 turbines as a proportion of the 297 turbines in Tiers 1 and 2. Doing so results in estimates of reduction of 9.9% for golden eagles, 6.4% for red-tailed hawks, 5.8% for American kestrels, and 6.4% for burrowing owls. The combined mortality reduction for eagles, red-tailed hawks and burrowing owls is estimated to be about 6.7%.

The plan states that the turbines at the Diablo Winds Repowering Project, and all future re-powering projects, are excluded from the relocation experiment. If monitoring determines that a specific turbine in a re-powered area is high risk, what is the proposed follow-up action to be taken to reduce the risk of that turbine?

Are the turbines greater than or equal to 250 KW that will be excluded from the temporary shut down considered high risk turbines by Smallwood and Spiegel (2004)?

Repowering is not a condition of the use permit and should not be considered mitigation for existing conditions.

The plan states that monitoring is a critical element of adaptive management and in evaluating the progress and success of the plan. It also states that the extent of monitoring and research activities is contingent upon receiving PIER funding from the Energy Commission. As stated in previous comment letters and at the Working Group meetings, the Energy Commission cannot be held responsible for fulfilling the monitoring obligations that are considered a critical element of the plan.

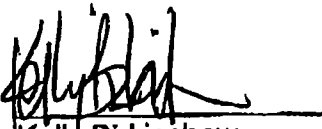
The citation of Smallwood as a personal communication regarding the determination of the 29 meter height of turbine blades is incorrect. The 29 meter height was derived from observed flight height observations in the APWRA.

We believe that Erickson et al. 2001 and 2004 on page 1, and WEST 2005, and WEST on page 7 are incorrectly cited.

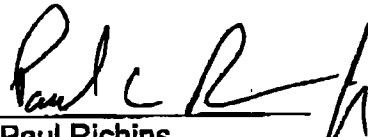
Mr. Chris Bazar
3/8/2005
Page 4

Thank you for the opportunity to comment on WEST, Inc's draft management plan. If you have any questions, please contact Melinda Dorin at 916 654-4024 or Linda Spiegel at 916 654-4703.

Sincerely,



Kelly Birkinshaw
Project Manager, PIER Environmental Area



Paul Richins
Manager, Environmental Office

ATTACHMENT 5

1 Richard R. Wiebe (SBN 121156)
2 Law Office of Richard R. Wiebe
3 425 California Street, Suite 2025
4 San Francisco, CA 94104
5 Telephone: (415) 433-3200
6 Facsimile: (415) 433-6382

7 Attorney for Plaintiffs
8 Center For Biological Diversity, Inc.;
9 Peter Galvin

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SUPERIOR COURT OF THE STATE OF CALIFORNIA
COUNTY OF ALAMEDA

CENTER FOR BIOLOGICAL DIVERSITY, INC.;
PETER GALVIN,

Plaintiffs,

v.

FPL GROUP, INC.;
FPL ENERGY, LLC;
ESI BAY AREA GP, INC.;
ESI BAY AREA, INC.;
GREP BAY AREA HOLDINGS, LLC;
GREEN RIDGE POWER LLC;
ALTAMONT POWER LLC;
ENXCO, INC.;
SEAWEST WINDPOWER, INC.;
PACIFIC WINDS, INC.;
WINDWORKS, INC.;
ALTAMONT WINDS, INC.,

Defendants.

Case No. RG 04 183113

**PLAINTIFFS CBD AND
GALVIN'S OPPOSITION TO
DEFENDANTS' DEMURRER**

COMPLEX CASE

Date: February 10, 2005
Time: 9:00 a.m.
Dept.: 22
Judge: The Hon. Ronald M. Sabraw

Action filed: November 1, 2004
Trial Date: Not set

1 Plaintiffs CENTER FOR BIOLOGICAL DIVERSITY, INC. ("CBD") and Peter Galvin
2 hereby oppose defendants' demurrer. Although the First District Court of Appeal has now
3 conclusively determined that Proposition 64 is not retroactive, *Californians for Disability Rights v.*
4 *Mervyn's* (No. A106199; Feb. 1, 2005), plaintiffs submit this opposition for the aid of the Court.

5 NATURE OF THE CASE

6 The region around Altamont Pass has one of the highest known densities of Golden Eagles.
7 It is also rich in other raptors as well, like hawks, falcons, and owls. For thousands of years these
8 magnificent birds have soared the skies free. Starting twenty-five years ago, the wind power
9 industry began erecting wind turbines on the ridges where the eagles roam. Eventually, there were
10 over 5,000 turbines installed at Altamont Pass. No Environmental Impact Report was prepared
11 before these thousands of turbines were installed.

12 In 1984, the first reports came in that the turbines were killing raptors. Notable scientific
13 studies and reports were published in 1991, 1992, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001,
14 2002, and 2003. The latest study, published by the California Energy Commission in August 2004,
15 shows that Altamont Pass wind turbines are currently killing from 880 to 1300 eagles, hawks,
16 falcons, and owls each year, including between 75 and 116 Golden Eagles annually.

17 The result is that, over the past twenty-five years, the Altamont Pass wind power industry in
18 its pursuit of profits has illegally slaughtered 17,000 to 26,000 or more eagles, hawks, falcons, and
19 owls, and tens of thousands of other protected birds. As stated in the Complaint, these killings are
20 criminal violations of the federal Migratory Bird Treaty Act, the federal Bald and Golden Eagle
21 Protection Act, and numerous provisions of the state Fish and Game Code.

22 Defendants for the most part are not the original operators of the wind turbines, but entities
23 who took over operations in 1998, after the original operators had gone bankrupt and at a time when
24 it was well known that the Altamont Pass wind turbines were killing hundreds of eagles, hawks,
25 falcons, and owls each year. The Energy Commission has now called on defendants to reduce their
26 killing by 50% in three years and 85% in six years, and to pay millions of dollars per year in
27 restitution for the birds they will still be killing. Defendants, however, have to date taken no
28 effective steps to reduce this slaughter, and to date have escaped all legal liability for their crimes.

ATTACHMENT 6

BILL LOCKYER
Attorney General

State of California
DEPARTMENT OF JUSTICE



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July 6, 2005

Alameda County Board of Supervisors
1221 Oak Street, Suite 536
Oakland, CA 94612

RE: Appeal by the Californians for Renewable Energy, Inc., the Center
for Biological Diversity and the Golden Gate Audubon Society Regarding
the Conditional Use Permits for the Maintenance and Operations of
Existing Wind Turbines in the Altamont Pass Wind Resources Area

Dear Honorable Board Members:

We submit the following comments for your consideration in determining whether, and on what conditions, to renew the conditional use permits (CUPs) for the wind turbines currently operating in the Alameda County region of the Altamont Pass Wind Resources Area (APWRA). We appreciate your efforts to ensure that the CUPs, if renewed, will be conditioned to reduce the ongoing bird mortalities at the APWRA.

At issue are the steps government should take to balance protection of bird species, particularly raptors, and energy production. Scientific research sponsored by the California Energy Commission (CEC) has shown that the APWRA turbines kill between 1,766-4,721 birds annually. Of that number, between 881-1,300 are raptors such as golden eagles, hawks, falcons and owls. Since the project began operation, the CEC estimates that between 17,000-26,000 raptors have been killed by the turbines. The APWRA is an important raptor area because it has high densities of breeding populations, and is both a bird wintering area and a major migratory route. To date, the wind companies have implemented few mitigation measures to reduce these ongoing bird mortalities. Yet, there are ways technically and economically to continue to operate the turbines and at the same time significantly reduce their impacts.

As background, our office and the Alameda County District Attorney's Office became involved in these issues at the invitation of Judge Ronald Sabraw of the Alameda County Superior Court in relation to a suit filed by one of the appellants, *Center for Biological Diversity v. FPL Group*, Case No. RG04183113. As part of our investigation to decide whether to intervene in that lawsuit, we met with the appellants, Chris Bazar of the Alameda County Planning Department, and twice with representatives of the wind companies. We have been closely coordinating this effort with the U.S. Attorney's Office and the Alameda County District

Attorney's Office. We also have consulted with an expert studying avian mortality at the APWRA, Shawn Smallwood, as well as staff at the CEC, Linda Spiegel, and staff at the California Department of Fish and Game and the U.S. Fish and Wildlife Service. From the outset, it became clear that the current operation of the turbines at the APWRA presents a significant problem with extremely high levels of bird mortality. After our most recent meeting with the wind companies on June 23, 2005, we have determined that the current proposal from the wind companies in the working group process does not do enough to reduce bird mortalities, and is deficient in a number of respects, as outlined below.

The wind companies propose to reduce avian mortality by certain percentages in the first three years (25% in year one, 30% in year two, and 35% in year three), through implementation of a partial winter shutdown and a permanent shutdown of 2% of the high risk turbines (about 100 turbines). Not only are these low target goals, but the measures proposed by the companies to accomplish the goals lack scientifically-sound study designs to ensure reliable bird mortality data.

The companies also have proposed to monitor only some of the turbines repowered to date to determine whether to repower additional turbines beginning in year four. The companies will only "consider" the removal of high risk turbines in developing repowering projects. In year four, if they do not repower, they will aim for a 40% in reduction of bird mortalities in year four and a 45% in reduction in year five, again low target goals. The companies will await the completion of the County's environmental impact report (EIR) to identify off-site mitigation, as well as other specific measures to mitigate avian mortality. As indicated in their February 2005 plan, all performance standards, goals and mitigation measures can be changed, and the wind companies can "opt out" of the plan due to an unacceptable financial hardship. Monitoring is contingent on the companies obtaining CEC funding. The companies have retrofitted some electrical lines, and will consider retrofitting additional lines only when problems arise. They will move the derelict turbines and the rock piles, but it is unclear when this will occur.

In our view, this proposal does not go far enough in mitigating the serious ongoing impacts of these operations. Relying on the best available science resulting from years of study sponsored by the CEC and others, we have concluded that the mitigation measures proposed in the CEC's August 2004 consultant report and the Smallwood and Spiegel January and June 2005 assessments present the best opportunity to reduce avian mortality, while at the same allowing for the continued economic viability of the production of wind energy at the APWRA.¹ Specifically, we recommend inclusion of the following as conditions to the permit, which we have previously communicated to the wind companies:

1. Beginning in year one, permanently shut down the turbines in Tiers 1-3 (as

¹We base our statement of economic viability upon a review of publicly-available documents in the absence of the companies providing financial information, which we have requested several times.

identified in the June 2005 Smallwood and Spiegel assessment) which are the worst offending turbines (this amounts to about 300 turbines). In combination with this, seasonally shut down 100% of the existing turbines in the winter months (November 15 to February 28) in all years. This period is at a time of high bird use but low energy demand. Based on an assessment by Smallwood, these shutdowns will achieve an estimated 50% reduction in raptor mortality, but will impact power production by only 17.5%.

2. The EIR, which is to be finalized by the end of year three, should assess the environmental impacts of both repowering and the existing facilities. A range of mitigation measures should be explored in addition to repowering, especially considering that if repowering occurs it will be phased in over the remaining ten years of the permits.
3. In year four, repower by removing high risk turbines or implement further mitigation measures to achieve an 85% reduction in mortality by year six.
4. Beginning immediately, implement other measures identified in the CEC August 2004 report to the extent that they have not already been adopted. These include: retrofitting all electrical lines, removing derelict turbines, and relocating rock piles away from the turbines.
5. Immediately implement off-site mitigation. The off-site mitigation must be sufficient to compensate for past harm as well as for future mortality associated with the existing and repowered turbines. Off-site mitigation could be achieved through purchase of easements to protect bird habitat for breeding and foraging, to compensate for the bird mortality that has gone unchecked for the last twenty years.
6. The wind companies should be required to pay for a neutral expert, to be selected by the County, to sit on the scientific review panel and monitoring team and to advise the County.
7. Monitoring, to be funded by the wind companies, should be required in all years and should consist of a statistically-defensible design that can reliably detect changes.
8. Finally, there should be no opt-out provisions in the permit.

We also have some concerns about the County's compliance with the California Environmental Quality Act (CEQA). We understand that the County is not preparing an EIR concurrent with the proposed renewal of the CUPs, but rather that it will prepare an EIR over the next three years. Since the impacts of the existing facilities at the APWRA have not previously

been analyzed and circulated for public review and comment in a prior EIR, we have some concerns about this approach. However, if the proposed EIR analyzes both the impacts of repowering and the impacts from the existing wind turbines and other facilities, with a goal of identifying a range of potential alternative mitigation measures to address all of those impacts, this would go a long way towards alleviating our concerns.

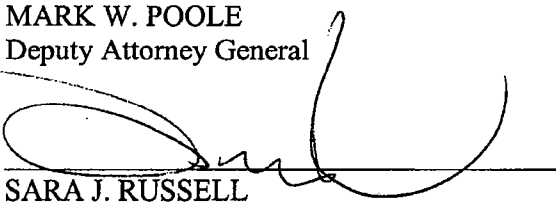
Finally, we have some concerns that the decision to issue the CUPs may be made without the benefit of even basic financial data reflecting the various wind companies' assertions of inability to pay for mitigation. We have been informed that this financial information has not been provided to the County. As part of our ongoing investigation of this matter, we have requested audited financial statements, financial filings with government regulators and other financial information on several occasions. However, to date no such information has been provided. Our concern is that the County may approve the CUPs and require less mitigation than that proposed by the CEC August 2004 report and the subsequent assessments by Smallwood and Spiegel, based on unsupported assertions of economic infeasibility, and without any opportunity to review evidence of each company's ability to pay. Our own review of publicly-available information indicates that a 17.5% loss in energy production due to implementation of the measures described above should not create a significant financial hardship for the wind companies.

In summary, the ongoing harm to protected bird species at the APWRA is serious and unacceptable. While we support the development of wind energy, wind production must be pursued in a manner that minimizes bird loss. Fortunately, significant reductions in avian mortality can be achieved in an economically-feasible manner. However, these measures must be implemented immediately to significantly reduce the ongoing impacts of the continued operation of the APWRA on bird populations. Because the APWRA is the largest of its kind in the world, what happens here could set an important precedent for how these issues are addressed elsewhere in California and the United States. We appreciate your efforts to address these difficult issues, and the opportunity to express our views.

Sincerely,

BILL LOCKYER
Attorney General of the State of California
TARA L. MUELLER
Deputy Attorney General
MARK W. POOLE
Deputy Attorney General

By:


SARA J. RUSSELL
Supervising Deputy Attorney General

cc: Chris Bazar, Alameda County Planning Director
Thomas J. Orloff, District Attorney
Christopher G. Carpenter, Assistant District Attorney
Stacey Geis, Assistant U.S. Attorney
Daniel Crum, U.S. Fish and Wildlife Service
Linda Spiegel, California Energy Commission
Janice Gann, Department of Fish and Game
Shawn Smallwood, Ph.D.
Counsel for the Wind Companies
Counsel for the Appellants

ATTACHMENT 7



Western EcoSystems Technology, Inc. 2003 Central Ave., Cheyenne, WY 82001
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July 29, 2005

California Energy Commission Dockets Unit
Attn: Docket No. 04-IEP-1G
1516 Ninth Street MS-4
Sacramento, CA 95814-5512

We offer the following comments on the CEC Staff Report Assessment of Avian Mortality from Collisions and Electrocutions (Staff Report, Melinda Dorin and Linda Spiegel, June 2005 CEC-700-2005-015 hereinafter referred to as "Staff Report"). We offer these comments at the invitation of CEC and in the spirit of providing scientific evaluation aimed at helping reduce avian fatalities at the Altamont Pass Wind Resource Area. We have been consulting with the California Wind Companies in an effort to develop an Adaptive Management Plan designed to significantly reduce avian fatalities at the APWRA while maintaining a viable wind power industry.

WEST is an environmental consulting company that specializes in the design and conduct of wildlife and natural resource studies. We work for state and federal government agencies, industry and NGOs. WEST has been involved in numerous studies of the impacts of human development on wildlife. For example, a WEST team, including Wally Erickson and I, designed surveys and subsequently analyzed data for the Trustees (i.e., U.S. Forest Service and the State of Alaska) regarding the impacts of the Exxon Valdez oil spill on benthic communities. West continues to work with U.S. Fish and Wildlife Service, U.S. Forest Service, and U.S. Geological Survey Biological Resources Division, and various states on numerous wildlife issues. For example, I am currently the Executive Director of the Platte River Cooperative Agreement and my duties include providing administrative and scientific support to three states and the Department of the Interior for the management of habitat for four federally protected species, the whooping crane, least tern, and piping plover in central Nebraska and the pallid sturgeon in eastern Nebraska. Wally Erickson is currently involved in several federal research projects including brown bear habitat selection and the impact of human development on those selections and behavior and other responses by Pacific brant to human impacts in Alaska and Mexico. WEST recently conducted a western range-wide study for the U.S. Fish and Wildlife Service to estimate the population size of golden eagles in 2003 (Good et al. 2004).

We have been involved in studying the interactions of wind turbines and wildlife since the mid 1990s. We designed and conducted wildlife studies at several of the first new generation wind projects built in the U.S. We participated in several government agency

and industry funded baseline and post construction, monitoring and research at wind power projects across the country. I am one of the principle authors of *Studying wind energy/bird interactions: a guidance document* for the National Wind Coordinating Committee Avian Subcommittee (Anderson et al. 1999). Wally Erickson was most recently a principal investigator in the fall 2004 bat research at two facilities in the eastern U.S., under contract to Bat Conservation International. Both Mr. Erickson and I have participated in CEC funded research, for example studies at Tehachapi Pass and San Geronio wind resource areas, and peer review, for example CEC golden eagle population study conducted by Grainger Hunt in the Altamont Pass and the Commission's Pier Road Map.

Wally and I are active participants in the Wildlife Working Group of the National Wind Coordinating Committee (NWCC). A consensus-based collaborative formed in 1994, the NWCC identifies issues that affect the use of wind power, establishes dialogue among key stakeholders, and catalyzes appropriate activities to support the development of environmentally, economically, and politically sustainable commercial markets for wind power.

For more detail on our company and clients we refer you to our web site (www.west-inc.com).

Sincerely,

M. Dale Strickland, Phd.
Vice President and Senior Ecologist

SCIENTIFIC REVIEW OF CEC STAFF REPORT AND RELATED SUPPORT DOCUMENTS

July 29, 2005

Dale Strickland and Wally Erickson

Western EcoSystems Technology Inc., 2003 Central Avenue, Cheyenne, WY, 82001

EXECUTIVE SUMMARY

We offer the following comments on the CEC Staff Report Assessment of Avian Mortality from Collisions and Electrocutions (Staff Report, Melinda Dorin and Linda Spiegel, June 2005 CEC-700-2005-015 hereinafter referred to as “Staff Report”). These comments are made at the invitation of CEC and in the spirit of providing scientific evaluation to reduce avian fatalities at the Altamont Pass Wind Resource Area. We have been consulting with the California Wind Companies to develop an Adaptive Management Plan designed to significantly reduce avian fatalities at the APWRA while maintaining a viable wind power industry. We believe strongly there is a need for a full and complete scientific peer review of the August 2004 CEC report and of all subsequent PIER staff reports (and assessments based on those reports) in the context of proposed management actions to reduce avian fatalities.

Our review addresses the following areas.

1. The Staff Report should include a much more comprehensive literature review of the impacts of wind turbines on birds. The report focuses primarily on CEC PIER sponsored research, but could be improved by including other monitoring and research conducted outside California.
2. We disagree with some of the statistical methods, assumptions, and the subsequent results in CEC reports and technical memorandum¹ used as a basis for the Staff Report. We believe these problems lead to some inappropriate conclusions in the Staff Report.
3. We think the discussion of avian mortality from the High Winds project could be strengthened by comparing the mortality estimates, raptor use estimates, and risk indices (ratio of the two) from that site to other similar “new generation” wind

¹ Smallwood, K. S. and C. G. Thelander. 2004. Developing methods to reduce bird fatalities in the Altamont Wind Resource Area. Final Report by BioResource Consultants to the California Energy Commission, Public Interest Energy Research-Environmental Area, under Contract No. 500-01-019 (L. Spiegel, Project Manager).

Smallwood, S. and L. Spiegel. 2005a. Assessment to Support an Adaptive Management Plan for the APWRA. CEC released Technical Report. January 19, 2005.

Smallwood, S. and L. Spiegel. 2005b. Partial Re-Assessment Of An Adaptive Management Plan For The APWRA: Accounting For Turbine Size. CEC released Technical Report. March 25, 2005.

Smallwood, S. and L. Spiegel. 2005c. Combining Biology-Based And Policy-Based Tiers Of Priority For Determining Wind Turbine Relocation/Shutdown To Reduce Bird Fatalities In The APWRA. CEC released Technical Report. June 1, 2005.

plants, which are very unlike the Altamont wind development. Bat mortality is also discussed at High Winds and could be strengthened by comparing those results with results from other projects in the west. Background fatality estimates from other studies should also be discussed, especially given the large intervals between searches.

4. Presentation of raptor use estimates among different wind resource areas should include a discussion of the assumptions and methods including the size of the areas surveyed and survey durations.
5. Baseline fatality rates are based on searches conducted on average approximately once every 50 to 90 days, and are not based on site specific scavenging and searcher efficiency adjustments. Most studies of avian fatalities at wind plants conduct searches on intervals of 30 days or less and include site specific scavenging and searcher efficiency studies when the objective is to estimate fatality rates. Inconsistencies in raptor mortality estimates in the August 2004 CEC staff report, which vary by as much as 50 to 90% are likely unreliable for use in evaluating management measures and need to be reviewed.
6. We agree with the Staff Report's assessment that the effectiveness of the management measures proposed by PIER CEC staff is unknown and needs to be tested. Other management measures, such as the seasonal shutdown of turbines, which was proposed by the Wind Companies in the Altamont, also needs to be tested for effectiveness.

1.0 Introduction

We offer the following comments on the CEC Staff Report Assessment of Avian Mortality from Collisions and Electrocutions (Staff Report, Melinda Dorin and Linda Spiegel, June 2005 CEC-700-2005-015 hereinafter referred to as “Staff Report”). We focus our comments on the discussion of avian and bat collisions with wind turbines.

Our review addresses three general areas:

- (1) The review of available literature.
- (2) Statistical analysis used as the basis of some of the conclusions.
- (3) The need for peer review of the August 2004 CEC report and the subsequent staff reports in the context of proposed management actions to reduce avian fatalities.

We elaborate on these general areas in the following sections.

2.0 Comprehensive Literature Review

This Staff Report uses existing information to draw conclusions about wind power and its impacts to birds and bats. The report appears to focus primarily on CEC-sponsored research conducted in California, and does not consider many sources of literature available outside California at new generation wind projects. There is significant literature available from other new generation wind projects that was not included in the Staff Report. Numerous studies² have been conducted at new generation wind projects outside California using standardized methods and metrics that would be useful for this report. The analysis in this report demonstrates why the comprehensive literature review is important.

3.0 Statistical Analysis

Many of the conclusions in the Staff Report were based on the August 2004 CEC report and subsequent reanalysis of the data contained in that report. We have several statistical concerns about the interpretation and summary of these research results in the Staff Report. We also have concerns with some of the statistical analysis in the August 2004 CEC report, which were offered to CEC over the past year, including a formal set of comments submitted prior to the release of the August 2004 CEC report (see Attachment A).

² see for example, Kerlinger et al. (2005), Kerlinger and Kerns (2004), Erickson et al. (2004), Johnson (2000), Johnson et al. (2004), Young et al. (2003), Kerns et al. (2005)

3.1 Mortality and Collision Risk at High Winds and Other Wind Project Areas

The Staff Report characterizes the High Winds facility (HW) as an area with a “high rate of bird mortality,” when compared to other wind facilities. The observed fatality rate (i.e., # fatalities/MW/year) is lower than rates observed at the Altamont Pass Wind Resource Area (AP), even though, on average, searches were conducted much more frequently at the HW facility (~14 day search intervals) compared to the CEC study in the AP (50 to 90 day search intervals). Our preliminary calculation of potential differences in collision risk at the HW and the AP suggest that the greater rates of raptor fatalities at the HW can be partially accounted for by differences in raptor use (Table 1). Based on a commonly used collision risk index (ratio of fatality rate to raptor use; see Anderson et al. 2004, Anderson et al. 2005, Smallwood and Thelander 2004), and under the assumptions that the methods used do not greatly bias results, the AP appears to present higher collision risk for raptors than HW (Table 1).

TABLE 1: COMPARISON OF USE, UNADJUSTED FATALITY RATE, AND RISK INDICES. AP=Altamont Pass, raptor use estimates from Table 29, Kerlinger et al. (2005), all raptor use estimate from Smallwood and Thelander (2004), unadjusted fatality rates from Smallwood and Thelander (2004). HW=High Winds, raptor use estimates from average of pre- and post- construction estimates from Kerlinger et al. (2005); fatality estimates calculated from same report, Table 4. For illustration.

Species/Group	Raptor Use (#/20-min survey)		Unadjusted Fatality Rate (#/MW/yr)		Risk Index (Fatality Rate/Raptor Use)	
	HW	AP	HW	AP	HW	AP
American kestrel	0.68	0.09	0.24	0.13	0.35	1.44
Red-tailed hawk	1.40	0.64	0.08	0.36	0.06	0.56
Golden eagle	0.25	0.33	0.01	0.10	0.04	0.30
All raptors	3.36	~2	0.35	1.1	0.10	0.55

For example, based on the studies used, American kestrel use at HW is estimated to be approximately 7 times greater than at AP, yet the fatality rate for the same species is only approximately twice as high at HW. Thus, the collision risk index³ for the likelihood that an American kestrel will collide with a wind turbine at HW is lower than at AP. Even potentially larger differences in risk are shown for other species/groups analyzed; including golden eagle, red-tailed hawk, and all raptors suggesting HW presents a much lower risk than AP. We consider this information preliminary due to the on-going monitoring conducted in HW and AP and because of possible biases due to different methodologies in the two studies. However, we recommend a more thorough review of

³ The index assumes collision risk is related to the ratio of the fatality rate to raptor use. This ratio has been used in Anderson et al. (2004) and Smallwood and Thelander (2004)

this and other similar information collected at other wind projects be included in the Staff Report.

3.2 Bat Mortality

We believe the Staff Report should provide more discussion of bat mortality at wind projects by including the many reports and publications relative to bat mortality at new wind projects in the U.S. Bat mortality has been documented at all wind projects, and most studies outside California have attempted to estimate associated fatality rates (Johnson et al. 2004). A thorough review would show that the bat mortality observed at HW appears relatively consistent with the levels of bat mortality observed at other new generation wind projects in open habitats of the western and Midwest U.S. (Johnson 2004).

3.3 Raptor Use Estimates

We believe the Staff Report should specifically identify the source of each raptor use value in the graph, describe the methods used for each estimate, and describe the method used to standardize the data to a common metric. Also, we believe the reference to Orloff (1992) at the bottom of the figure should be Orloff and Flannery (1992). One concern we have with the reporting of raptor use from different studies in the Staff Report is that the methods of data collection differed among studies, and these differences may bias the comparisons. We have a similar concern about this issue in the August 2004 CEC report. For example, methods were different among the studies included in figure 4-7 on page 85 of Smallwood and Thelander (2004). The viewshed used by biologists for estimating raptor use in the August 2004 CEC study appears to be 300 m. The recent studies at Tehachapi Pass and San Geronio use only observations of birds within 200 m of the observers to compare raptor use, however, all birds were recorded out to an unlimited viewshed (i.e., record all birds seen). The studies referenced in Figure 2 in the Staff Report also used different survey durations. For example, Orloff and Flannery (1992) used 10-minute scans, Anderson et al. (2004, 2005) used 5-minute scans, and Smallwood and Thelander (2004) used 30-minute scans. We believe the different methods and assumptions should be described and evaluated to determine potential biases for these comparisons. This evaluation of the sensitivity of the estimates to the assumptions would strengthen the statistical confidence in the conclusions.

Figure 2 in the Staff Report presents measures of raptor and avian use at the AP, HW, Tehachapi Pass, and San Geronio wind facilities. However, the numbers reported in the figure are not consistent with the numbers reported in the text. For example, the text on page 18 states that Orloff and Flannery (1992) estimated 2.3 raptors/10-minute scan in the fall, while the value in Figure 2 used is 1.68 raptors/10-minute scan. Also, the raptor estimate in Figure 2 for AP for all seasons is larger than the all-bird estimate (1.26 versus 1.07), which is not possible unless the sources for the raptor and for the all-bird estimates are different. Based on the references listed below the table, we suspect that some of the estimates in Figure 2 for the AP are from Smallwood and Thelander (2004), while the text reports the data from Orloff and Flannery (1992). We also believe there is more

contemporary data that has been collected in the HW area (e.g., Kerlinger et al. 2004) and should be utilized.

3.4 Fatality Rate Calculations

Estimates of total bird fatality and total raptor fatality rates are included in the Staff Report. We understand the rates are based on the August 2004 CEC report and we have technical concerns with methods used to calculate the rates in that report.

3.4.1 All Bird Fatality Estimates

All bird fatality rates included in the Staff Report are a potential metric for comparing the risk to birds among the AP wind resource area and other wind developments, and could potentially be used to estimate the effectiveness of risk reduction management proposed by the companies. However, the study design used in the research described in the August 2004 CEC report was most appropriate for relating the location of raptor fatalities to the physical and biological characteristics for those locations and not for estimating an all-bird fatality rate. The lower end of the range of fatalities (1,766 birds) is based on the actual number of birds found during the study with a search detection correction and the upper end of the range (4,721 birds) includes an additional adjustment for scavenging. Scavenging and searcher efficiency data for these adjustments are based on other studies including a project we conducted in Oregon and Washington (Erickson et al. 2004) and Orloff and Flannery (1992). Based on the correction factors identified for small birds for scavenging in the August 2004 CEC report, it appears the method of adjustment assumes all birds died approximately 40 days before the search, rather than at random times between searches. This would tend to overestimate the fatality rate of small birds, even if the Stateline estimates were appropriate for the AP. The August 2004 report also applies the small bird scavenging rate from the Stateline study to medium-sized birds in the AP study (e.g., rock dove), also potentially overestimating the fatality rates of these birds.

The CEC study also used wide intervals between searches (mean is approximately 53 days for the first sampling set, and 90 days for the 2nd sampling set). We believe these wide search intervals and the lack of site-specific searcher efficiency and scavenging rates significantly reduce the reliability of fatality estimates for small and medium sized birds in the August 2004 CEC report (Attachment A). A similar large interval between searches at the Tehachapi Pass and San Geronio Wind Projects was the primary reason why Anderson et al. (2004) did not attempt to make all-bird fatality estimates. We welcome further discussions on this issue with the authors.

3.4.2 Inconsistency of Raptor Mortality Estimates

The raptor fatality data contained in the August 2004 CEC report will serve as the baseline for determining the effectiveness of the proposed management measures for reducing raptor mortality. However, we are concerned about some apparent inconsistencies in the tables of fatality rates in the August 2004 CEC report. Individual

raptor species mortality estimates, when summed, were significantly less than the value reported for raptors combined (see for example, Table 3.9 and Table 3.11).

From Table 3.9, Page 70, August CEC report

Species/Taxonomic group	Mortality (deaths/MW/year)	
	First Set	2nd Set
Ferruginous hawk	0.0000	0.0348
Northern harrier	0.0027	0.0000
Prairie falcon	0.0042	0.0000
Turkey vulture	0.0098	0.0000
Great horned owl	0.0245	0.0040
Golden eagle	0.0380	0.1391
American kestrel	0.0614	0.1251
Barn owl	0.0662	0.0292
Burrowing owl	0.1674	0.1000
Red-tailed hawk	0.2953	0.2490
All raptors (Table 3.9)	0.9526	1.2332
All raptors (sum above)	0.6695	0.6812

Note that the estimate for all raptors at the bottom of the table is 0.67/MW/year for the first set and 0.68/MW/year for the second set, which is nearly identical. However, the number reported for all raptors in the bottom of the table is 50% higher in the first set, and 90% higher in the 2nd set. The lead author indicated to us in an email that the primary reason for this discrepancy was that some species were omitted from table 3.9. However, the August 2004 CEC report (page 64, Table 3.1) confirms that the species listed in Table 3-9 include all the raptor species that were included in fatality estimates. The difference in the unadjusted fatality rates for the entire AP is as much as 300 raptors depending on which method is used. This difference in total mortality is even more exaggerated when assumptions are made regarding searcher efficiency and scavenging bias. We believe that this discrepancy should be clarified before a final decision is made on baseline fatality rates for testing of management measures.

We also believe there may be some additional adjustments necessary prior to finalizing the baseline fatality rates for evaluation of management measures. A few database errors have been identified that would have some effect on the values in Table 3.9, and in other analyses such as modeling of high risk turbines. We recognize that all large field-collected data sets such as the AP data have the potential for errors. Through our review of the data we have been given to date we identified several potential errors in the summary data set that we previously communicated to CEC. For example, the turbines at the City of Santa Clara site were incorrectly classified as Kenetech 56-100 turbines (~200 turbines), but are upwind Vestas V-17 and V-19 model turbines. Several of these turbines were also incorrectly classified as windwall turbines. This latter error was detected by the CEC scientists and discussed in Smallwood (2004).

A more recently discovered error was also communicated verbally to the CEC scientists. Many turbines sampled at the Patterson Pass Site that are 65-kW turbines (approximately 200) were incorrectly classified as Bonus 150-kW turbines. This error and the misclassification of turbines at the Santa Clara site and the Patterson Pass site could influence the risk models in the August 2004 CEC report and subsequent reports (Smallwood and Thelander 2004, Smallwood 2004, Smallwood and Spiegel 2005a, 2005b, 2005c), since the windwall classification, turbine model, and turbine size are factors included in some of the risk models. These errors could also have some effect on the fatality rate estimates provided in the August 2004 CEC report. However, we do not know the degree to which the results would be affected if the errors were corrected without reviewing the underlying data. We have only received a partial data set, and it appears that this data set still contains the misclassified turbines from the Patterson Pass Site.

3.4.3 Cause of Death Determination and Background Mortality

During the workshop on June 28, 2005, there was discussion regarding the determination of cause of death for fatalities found during the CEC study. Given the large interval between searches in the CEC study, many of the carcasses were old and desiccated which made it difficult to assign cause of death. Most carcasses that were found were considered turbine-related. However, there is likely some background mortality that is included in the turbine-caused fatality rate estimates. An unknown number of the fatalities likely are caused by other factors not related to collisions with the wind facility (e.g., caused by raptors, coyotes, collision with vehicles, and other structures). No comparable information on background fatality rates is known for the AP.

A few studies at wind projects have provided information on background mortality. During a four-year study at Buffalo Ridge (Minnesota), 2,482 fatality searches were conducted on study plots without turbines to estimate background mortality (Johnson *et al.* 2000). Thirty-one avian fatalities were discovered in the plots without turbines consisting of 15 species including eight upland game birds, seven doves, five sparrows, three waterfowl, three raptors, two blackbirds, one waterbird, one shorebird, and one unidentified bird. Background mortality averaged 1.1 fatalities per plot per year, and ranged from 0.98 to 4.45 fatalities per turbine search plot per year in different portions of wind resource area (Johnson *et al.* 2000). Some pre-project carcass searches were conducted at a proposed wind project in Montana (Harmata *et al.* 1998). Three bird fatalities were found, two presumed raptor kills and another from an unknown cause during 8 searches of 5 transects, totaling 17.61 km per search. A similar result was observed at San Geronio, where the observed fatality rate at the wind turbine plots was only approximately 25% higher than the reference fatality rate (Anderson *et al.* 2005).

We agree that background mortality likely varies among species and groups. The study of seasonal shutdown in the AP will provide some information on mortality unrelated to collision with moving turbines. Given the high degree of scrutiny, and proposals by some to consider mitigation for individual dead birds, it may be very important to quantify background mortality at AP.

3.5 Description of Management Measures and Uncertainty

We agree with the Staff Report assessment that the management measures proposed by the CEC need to be monitored to determine their effectiveness (page 25 and 26 of Staff Report). After review of the fatality data from the Wildlife Response and Reporting System (WRRS) and the August 2004 CEC study, and with their knowledge of wind production in the winter period, the companies proposed winter season shutdown of large numbers of turbines as a potential measure and this management method also needs to be monitored for its possible effectiveness.

The August 2004 CEC study is primarily geared toward estimating large-bird fatalities and developing associations between fatality locations and turbine and other physical and biological characteristics. Cause and effect is subjectively determined based on associations between fatalities and environmental variables and turbine characteristics (see comment #3 and other related comments in Attachment A). While these associations do not allow a direct statistical estimation of cause and effect, they did allow the CEC scientists to develop recommendations for management actions. It is important to place these management recommendations in perspective; they are statements of hypotheses and significant uncertainty exists over their potential effectiveness. The Adaptive Management Plan (WEST 2005) proposes an approach to address several of these uncertainties and, in an incremental process, test the management hypotheses.

The uncertainty in the permanent shutdown of high risk turbines is illustrated by the fact that the CEC Staff and consultants have provided at least five different sets of models and maps of high risk turbines (Smallwood and Thelander 2004, Smallwood 2004, Smallwood and Spiegel 2005a, 2005b, 2005c). In the earlier models, many of the largest turbines in the Altamont were identified as the most risky (e.g., Smallwood and Thelander 2004, Smallwood and Spiegel 2005a). In subsequent models, many of the smaller turbines were considered most risky (Smallwood and Spiegel 2005b). In the June Assessment (Smallwood and Spiegel 2005c), which combines models from the January Assessment (Smallwood and Spiegel 2005a) and the March Assessment (Smallwood and Spiegel 2005b), few turbines greater than 200 kW and few turbines smaller than 60 kW are considered high risk (Tiers 1 and 2), and most of the high risk turbines are now 65-100 kW turbines.

In addition, we have some concerns over the data that have been provided to us to allow us to recommend to the turbine owners which individual turbines are considered high risk. We were given a dataset at the end of January, 2005 that was purported to be the risk values for turbines from the January Assessment. However, we later received another data set identified as the risk values for turbines from the January Assessment (received July 2005) that appears to be very different than the dataset previously identified as the results of the January Assessment. We have asked for clarification of the different data sets, and also asked for more detailed dataset than includes the risk values for each of the models in the same dataset, but these requests have not been met to.

Variables considered in the various risk models have changed. For example, turbine type (tubular versus lattice) was considered an important variable in predicting risk for red-tailed hawks in the initial models (Smallwood and Thelander 2004, Smallwood 2004), and was discussed in the executive summary of the August 2004 CEC report as an important variable, but models developed later no longer considered this an important variable (Smallwood and Spiegel 2005a).

While we discussed these issues with the CEC staff on several occasions, we believe this uncertainty illustrates the need for careful evaluation of proposed management actions before broad scale application.

The August 2004 CEC report suggests that a relatively high level of fatalities occur in winter (November 15 – January 31). Because power production is, on average, relatively low in this winter period, the companies have proposed to test winter shutdown as a method to reduce fatalities while minimizing lost power production. This additional mitigation measure was discussed with the CEC and US Fish and Wildlife Service and it was considered to be an appropriate management measure. While the calculations in the CEC January report (Smallwood and Spiegel 2005a) suggest this management measure might be very effective, there are uncertainties. For example, the estimates of overall fatality reduction may be an overestimate since individual birds that are not killed during the winter because of the turbine shutdown may be killed at another time when the turbines are operating.

Another important assumption in the August 2004 CEC report is that the season when each kill occurred was accurately assigned. Fatalities were estimated at two sets of turbines. The average search interval for the turbines monitored the longest was approximately 53 days, while the average search interval for the 2nd set of turbines (approximately 2500 turbines monitored between November 2002 and May 2003) was approximately 90 days, leading to high uncertainty regarding when the fatality occurred, especially for the second sampling set. For example, we believe it would be very difficult to determine actual age of a carcass that has been desiccating for more than 30 days, making the assignment of month of fatality difficult. It is also not clear to us what affect the differing seasonal search intervals might have on the estimated reductions in fatalities from seasonal shutdowns or in the modeling process for determining high risk turbines. At a minimum, these factors add unknown levels of uncertainty to the predictions. For example, differential scavenging rates among seasons could affect results, and no scavenging studies were conducted.

Another important assumption in calculation of the seasonal fatality estimates is that searcher detection is consistent among seasons. For example, if searcher detection is higher in the winter compared to the other seasons, the effects of a winter shutdown may be underestimated. No searcher detection rates were estimated during the study reported in the August 2004 CEC report (Smallwood and Thelander 2004).

Because of these uncertainties, we have proposed an initial test of the seasonal shutdown hypothesis. The test includes shutting down approximately ½ of the wind turbines in

APWRA for a 2-month period (November and December) followed by shutting down the other ½ of the turbines for the following 2-month period (January and February) while restoring the first group of turbines to operation. This approach allows a comparison of the resulting fatality rates per megawatt during the shutdown period to fatality rates in previous years during the same operating period (a Before/After design; see Anderson et. al., 1999) and a comparison of fatality rates at the same turbines during the same season both operating and not operating (Crossover design; see Anderson et. al. 1999). The resulting data will provide an estimate of the fatality rates during 2-month winter segments (i.e., November/December and January/February) and with shorter search intervals, should allow verification of the winter season fatality rates. These data will also be used to further refine the months when winter shutdowns would result in the greatest fatality reduction for a given loss of power production. Statistical power calculations will be used to determine appropriate sample size, and it may be necessary to sample a larger sample in the winter period to answer with adequate certainty which months would result in the greatest fatality reduction.

4.0 Scientific Peer Review of Research and Collaboration

The August 2004 CEC report (Smallwood and Thelander 2004), the primary basis for this Staff Report, and the follow-up staff reports (Smallwood and Spiegel 2005a, 2005b, 2005c, Smallwood and Neher 2005), are important in the evaluation of the proposed management measures and should be peer reviewed in that context. This recommendation is consistent with the recent recommendations from the National Wind Coordinating Committee's Wildlife Working Group for research reports.

CEC has published several reports and/or technical memoranda subsequent to the August 2004 CEC report in response to some of the concerns we raised with the report's data analysis (Smallwood 2004, Smallwood and Thelander 2004, Smallwood and Spiegel 2005a, 2005b, and 2005c). We appreciate CEC's efforts to address these concerns. For example, the re-analysis reported in the March CEC report (Smallwood and Spiegel 2005b) addresses a short-coming in the modeling of high risk turbines (see Attachment B). The March CEC report (Smallwood and Spiegel 2005a), which was the third of five different efforts to model risk also was an attempt to address concerns we had on the original August 2004 CEC report and the January report (Smallwood and Spiegel 2005a). These five reports have not received widespread distribution and will not illustrate to most readers of the 2004 CEC Staff Report that the conclusions reached in the report have changed as a result of additional data analysis.

We strongly support the Alameda County proposed Scientific Review Committee to review the existing scientific research, the proposed management plan, and the implementation of the plan. We recommend that this peer review include access to the basic data necessary to conduct some independent analyses in development of the AMP. We feel these analyses are necessary to explicitly determine, for example, the baseline fatality rates, and to develop sample sizes necessary to create the statistical power to determining the effectiveness of management measures.

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Attachment A

July 7, 2004

Comments on the Draft August 2004 CEC report

Provided by Wally Erickson and Dale Strickland, WEST INC.

We appreciate the opportunity to comment on the report entitled “Developing Methods to Reduce Avian Mortality at the Altamont Pass Wind Resource Area”. Please feel free to call us to discuss these comments. Shawn has discussed some of these comments over some recent email exchanges. Hopefully our comments are helpful. We feel that a thorough review of this report by a statistician(s) is important, given the complexity and amount of data. We believe this review is a good starting point to that thorough review, but may fall short given our recent schedules (including vacation time), and the time frame provided for the review.

General

1. This is an extremely important report, and the PI's should be commended for the amount of data that has been collected, the number of hypotheses that were addressed, and the amount of work that went in to producing this mammoth document. We also acknowledge the importance of a brief executive summary and conclusions chapter that attempts to synthesize an enormous amount of information. Given the size of this document, many readers will probably read only the Executive Summary and Conclusions Chapter. We have already seen some select lines of text taken from your work that we believe are misinterpreted or not put into proper context. The Executive Summary and Conclusions sections, as they are currently written, leave the reader with the idea that most of the conclusions and associations are clearly defined, while the other chapters seem to indicate that most of the results are not so clearly defined. We think it is paramount that enough detail is provided in the Executive Summary and Conclusions so readers do not misinterpret the basis for conclusions. Specifically, there should be a paragraph in the Executive Summary, describing the type of study (mensurative), types of analyses (correlations and associations, not causation) the number of variables considered, many of which are confounded.

2. We think it is also important to clearly state in the Executive Summary and the Conclusions Chapter that the range of turbines sampled does not represent the typically turbines currently being installed.

Causality

3. Causality should not be discussed in this document at all, other than that causality cannot be statistically inferred from a mensurative experiment like this one.

4. It should be clearly stated that the basis for conclusions etc. is from associations between fatalities, behavior and use with physical, biological and wind turbine characteristics.
5. It should also be clearly stated that there is confounding and correlation among variables and that can affect these apparent univariate associations. This is discussed in several sections, but should also be discussed in the Executive Summary, and Conclusions Section.

Predictive Modeling

6. Conducting univariate tests is a reasonable start to developing a list of candidate variables for a “predictive model”. The approach to combine results from univariate tests into a scoring system, that does not account for confounding of variables, correlation of variables and interaction of variables is fairly uncommon and is often criticized as data dredging.
7. The more commonly accepted practice would be to use logistic (presence/absence of fatalities) or poisson regression (counts of fatalities), with the ability to model interactions of factors, treat variables as continuous (for example slope), etc. The influence of a variable could conveniently be portrayed as an odds ratio, and each turbine could be assigned a probability of occurrence of a fatality during a fixed time frame, or an expected number of fatalities in a fixed time frame.
8. This would hopefully provide a better map of the “predicted highly dangerous turbines”. In a univariate approach, the results of logistic regression and chi-square would be similar, with logistic regression or poisson regression using the turbine and not the individual fatality or individual bird minute as the unit of replication. Furthermore, with logistic or poisson regression, interactions could be tested.
8. The authors have said they do not think logistic regression and other types of multivariate analyses are appropriate. You have effectively developed a multivariate predictive model by combining results of univariate tests into a “scoring” or “ranking” system. You would want to limit the number of factors to consider, and number of interactions, but there are likely some very important interactions that should probably be discussed (e.g., topography and canyons). The models you have developed would be more defensible if they were corroborated with more standard approaches. The unequal sampling effort among sampled turbines (set 1, 2 and 3) can be accounted for in these multivariate approaches, using similar approaches to the adjustments you used in your chi-square analyses.
9. The omnibus chi-square tests (Tables 7-4 etc) does say anything about what levels of factors are significantly different. It could mean that one level is different than one other level, that a combination of two levels are different than a combination of another two levels etc. This is another reason why fatality rates and the chi-square tests should be portrayed for the factors considered in Chapter 7.

10. The method of “testing” adequacy of model is problematic and should be acknowledged. Testing models with the same data used to build the models will yield an overestimate of model fit.

Pseudoreplication

11. There is no discussion of the fact that the chi-square analyses conducted are based on assumptions of statistical independence of the experimental units. The individual fatality (Chapter 6) or minutes of bird use (Chapter 8) are considered the experimental unit in most of the analyses, and not the turbine or turbine string.

12. This appears to be an inappropriate experimental and results in “pseudoreplication,” resulting an overestimate of the precision of estimates. For the “predictive model” analyses and most individual species, the issue is not that big of a deal, since there are very few turbines that had more than one fatality of an individual species. It is likely a bigger issue for combined groups like all birds and all raptors. That may be why you are seeing so many “significant” differences in those categories (e.g., Table 7-1).

13. The number of turbines sampled is the true sample size, not the individual fatalities or individual minutes of bird use (Table 8-12).

14. We recommend using fatality rates or use rates and tests using the appropriate experimental unit.

15. This is likely why there were so many “statistically significant” tests. Many of those tests would likely not be “significant” if the appropriate experimental unit and error term were used. The logistic regression approach or poisson regression approach described above would use the turbine or turbine string as the unit of replication (experimental unit). Furthermore, for some factors such as tower type, rotor diameter, turbine model, fatality rates on a per turbine and per MW basis would likely help the reader have a better understanding of the differences when the fatality data are adjusted by turbine nameplate output. Larger rotor diameters were identified as more risky, but in fact, if you account for output or RSA differences, it will likely go the other way.

16. The same might be true for lattice and tubular. You advocate per MW calculations in discussing species and group fatality rates for the overall wind plant, and this should also be addressed in Chapter 7 when discussing differences in fatality rates among turbine types and turbine models.

Confounding of Variables

17. There should be a much bigger discussion of the correlation and confounding among the predictor variables. Many of the independent variables are correlated with one another.

18. Position within a string is likely correlated with slope and steepness and degree of lateral edge. Tower type is somewhat confounded with the canyon variable. For example, apparently there were no lattice turbines in canyons in the first sampling effort, while there were 142 of the 405 tubular tower turbines in canyons the same set.

19. This should be acknowledged. Could this be a plausible explanation for why tubular are considered worse than lattice?

20. Because of confounding, actual effect sizes could be larger (or smaller). Some many other factors could be confounded as well. Based on the maps, there would appear to be confounding among a higher percentage of tubular towers in canyons in the intermediate rodent control area. The areas of no control in the northwest portion of the project area has historically been associated with higher golden eagle mortality (Orloff and Flannery 1992, Hunt 2002) and could also affect interpretation.

21. Does it make sense to test some of the important effects within certain subgroups of turbines, to see if the pattern of effects of physical attributes of the locations are consistent. For example, what about looking at the effects of certain variables using only the 56-100 turbines? They are distributed throughout the wind project, and turbine characteristics would not be so confounded.

Adjustments in the Chi-Square Analyses

22. Were adjustments made in the chi-square analyses for search effort of individual turbines, or for search effort as a whole for turbine sample set 1 and set 2 turbines? We believe the Seawest turbines, which are part of your set 1 turbines (?we believe), were added after you started your NREL study as well. Was this differential sampling effort for individual turbine strings specifically accounted for, or was it accounted for more generally (all set 1 turbines adjusted the same, regardless of sampling effort).

23. Was the effort (# searches/year or # searches/6 months) considered the same for all turbines in set 1 and set 2.

24. Since there was an increasing interval between searches, was that considered in the development of “predictive models”?

Inference

25. The conclusions and executive summary do not acknowledge the data mining and data dredging aspects of these analyses.

26. Were all these variables and hypotheses decided upon a priori? With the number of variables and bird groups considered, there are expected to be many “significant associations” that are not real associations would be expected.

27. If variables were truly independent and pseudoreplication was not an issue, you would expect 10% of the tests to be significant by chance alone, using $\alpha=0.10$. Since pseudoreplication is an issue, you would expect even more tests indicating significant effects by chance alone. Reiterating, we believe you should acknowledge the limits of the study in the executive summary and conclusions including the pseudoreplication issue, the fact the associations do not imply causation, the multiple testing issue, and the confounding of variables.

Higher Use near Turbines

28. Two of the outcomes relate to raptor use and behavior are:

“Inter-specific variation in mortality among species could not be explained by variation in the number of flights within close proximity to wind turbines.”

“some bird species spent more time flying within 50 m of wind turbines than expected, and they spent less time within 51-100 m or 101 – 300 m, which indicated that those species were attracted to the areas near the wind turbines.”

Note: the first outcome contains redundant text, inter-specific variation is variation among species.

29. It is pretty well known that raptors use slopes along ridges and other topographic features, taking advantage of updrafts, and patterns in flight path data we have gathered at many wind projects prior to turbines being built have supported this. A great example would be a Foote Creek Rim, where we documented much higher use on the upwind site of the rim edge. Do you have data on ridges at Altamont Pass that do not have turbines?

30. Could some of the “turbine attraction” be based on raptor behavior in association with updrafts? Do you have any flight path data?

31. Is it possible that siting turbines as far to the leeward side of the ridge as possible might reduce mortality? We recommend this is discussed.

Rock Piles

32. There are several conclusions drawn that do not appear to be supported by the data. For example, presence of rock piles are said to increase fatalities in some areas of the APWRA although the univariate tests (Table 7-1) are not significant for the 4 target species (BUOW, AMKE, RTHA and GOEA). The only group that is significant is for all birds as a group, and as pointed out above, pseudoreplication caused by treating each fatality as an independent observation is a large problem with the all bird analyses. Based on more recent conversations with the authors we understand that there was an apparent relationship with rock piles in the earlier NREL study. Some discussion of this would be important so people understand why it was not shown in the larger sample of turbines and why the effect “went away” when data were pooled.

33. We recommend putting in a map of rock piles (at least string categories), like you have done for other variables. An explanation supported by data would be helpful so people understand why this particular effect (rock piles) was only observed in the earlier NREL study and not when data were pooled. We do not believe it is sufficient to say it is because it only occurred at the turbines initially studied. What is the “biological” reason for this inconsistency.

34. It would also appear to be the case with canyons. Some initial analyses we conducted of the effects of canyons are not as obvious in the 3rd sampling effort (set 2 turbines), based on some analyses we conducted.

35. This is not intuitive. The variable definition is somewhat arbitrary. We do acknowledge longer sampling at the 700-1500 turbines sampled in set 1. But 6 months of sampling at 2500 turbines is a big effort (similar effort to 400 turbines sampled for three years). One would hope that patterns observed in the first sample set were also observed in the 2nd and 3rd sample set.

36. The outcome regarding canyon effects appears to be supported by most of the data. A clear definition of a canyon turbine should be identified. The effect may be larger or smaller when considering confounding effects such as tower type. No lattice towers were located in “canyons” at the turbines sampled for the longest period (Group 1) (see confounding above).

37. We do not believe there is an association with canyons when you only look at the Group 3 data (2500 turbines x 6 months = 1200 turbine years of effort). Is there an explanation for this? We recommend that this be discussed.

Appendix A

38. The discussion of how search effort and fatalities/turbine/year or fatalities/MW/year is not easily understood and we believe will be miss-interpreted. We agree that the rate of a particular turbine string may not be stable after one year, but average rates of more than one turbine string would stabilize sooner than 3 years.

39. If interest is in an average fatality rate for a wind project, and not an individual turbine string, rates would stabilize sooner.

40. Several turbine models are nearly identical in tower height, as well as in other turbine characteristics, although there are great differences in effects. Any explanation? To get a more general relationship, does it make sense to combine similar turbine models

41. Only ~500 fatalities out of ~1100 “wind turbine fatalities” were listed on page 25. Are the remaining unknowns?

42. Were there any trials done to test the “days since death” estimates. We believe estimation of time of death can be pretty problematic.

Standardization by Effort

43. Several graphs display the total number of fatalities by levels of factors. For example, winter and summer are described as being the periods of highest fatalities, and a reference is given (Figure 2-5). We recommend standardizing the data by effort for seasonal comparisons. We believe winter may have been sampled with more effort, since the last sampling effort (2500 turbines) occurred during primarily the winter (November 2002 – April 2003). Figure 2-6 might be interpreted to indicate a certain model is more risky. We believe strongly that fatality rates should be graphed, not total numbers, or have at least both.

44. We recommend more detail on your conclusions that Altamont Pass is not an anomaly. We believe your basis for this is that raptor fatalities compared to your estimates of raptor use was not very different than other wind sites.

45. Our analysis appears to suggest an anomaly or uniqueness of some sort. Where in the report do you show these relationships?

46. Our comparisons suggest 2-4 times the use and 10-20 times the fatalities when compared to Foote Creek Rim, Buffalo Ridge, and Stateline wind plants. The largest per MW rate using the more intensive fatality methods that we have used (searches more frequently and adjustments for scavenging and searcher efficiency) is around 0.10 raptor fatalities per turbine per year, while your unadjusted estimates appear to be 1 raptor/MW/year.

47. Furthermore, if you included TUVU in your use estimates, use differences would be inflated even more between APWRA and other areas, since TUVU use is high at the APWRA

We think you would agree that fatality data for “all birds combined” are not very comparable to other studies, due to the high uncertainty from wide search intervals and scavenging and searcher efficiency biases.

48. We wonder if the methods used previously for documenting use in the APWRA (Orloff and Flannery 1992, 1996) were the same methods that you used. When you documented interactions of turbines and birds in your behavior studies, were you focused on a 360 degree area around the observer, or were observers focused on a smaller more focused area in front of the observer. This would be important in describing use including changes from your studies to the previous studies.

49. Make clear the adjusted fatality estimates reported in executive summary and conclusions is based primarily on experimental bias studies in Oregon and Washington.

Conflicting Results

50. Some results, on face value, seem to conflict with each other. It is stated that repowering with the tallest of towers should reduce mortality, but in the first bullet, it is suggested that turbines on taller towers are worse. Most people reading this would think those two results conflict with one another.

51. Also, is the outcome that most flights occur below rotor plane of new generation turbines for all birds, raptors, all diurnal birds etc. What about nocturnal migrants and bats?. Most of our data on flight altitudes at other wind projects put a large percentage of raptors in the rotor plane. The difference could be behavior.

52. KVS-33 turbines are discussed as some of the most dangerous turbines in the Executive Summary, but this is not mentioned in Table 7-4 except for one case (AMKE). Does not seem like a strong statistical basis for such a strong statement?

53. It should be noted that the KVS-33 fatality rate appears to be approximately twice as high for AMKE compared to 56-100, but the nameplate MW is 4 times higher, suggesting the per MW fatality rate is one-half that of 56-100. Replacing 4 56-100's with 1 KVS-33 would reduce mortality by 50% based on your data for AMKE. This was the only species where KVS-33 were listed in Table 7-4, so it would appear the fatality rates for these turbines would likely be quite a bit lower than the other smaller turbines for most other bird groups. This is another good example of why the data should be portrayed in Chapter 7 and in other chapters in terms of fatality rates by turbine type etc. It is easier to understand than "the accountability mortality %" for most readers.

Relocation and Shutting Down Turbines

54. Page 237, end of page. For golden eagles, red-tailed hawks and American kestrels, it was stated that elimination of most turbines may be the only way to "substantially reduce mortality". What is the definition of a substantial reduction in mortality, and is this considering all management measures, or only relocation?

55. What about repowering, what about other factors such as painting, and range management that have not been tested. What if effects are not additive, what about interactions?

Attachment B

TECHNICAL NOTE ON TURBINE SIZE AND RISK MODELING

Wally Erickson, WEST INC., 2003 Central Ave., Cheyenne, WY 82001

The individual turbine level risk models in the August CEC report were developed based mostly on data from KCS-56 (100 kW) and Bonus (120 to 150 kW) turbines (see page 189, Smallwood and Thelander 2004). Very little sampling effort occurred at turbines larger than these 100 – 150 kW turbines during the CEC study. The modeling approach in Smallwood and Thelander (2004) uses the number of turbines in each category (as well as time sampled) of each factor in calculating the expected number of fatalities. We have recommended to CEC that turbine size (e.g. rotor swept area) be incorporated into the chi-square tests, and specifically in the calculation of the expected number of fatalities. We believe the CEC modeling approaches (Smallwood and Thelander 2004, Smallwood and Spiegel 2005) may result in shutting down more MW than necessary to meet a particular mortality reduction level. This technical note describes the turbine size and risk modeling issue, and provides a potential alternative approach for modeling.

We suspect the CEC approach used for modeling may be one contributing factor leading to a high proportion of the largest turbines in the APWRA considered high risk in CEC reports (Smallwood and Thelander 2004, Smallwood and Spiegel 2005). The most recent approach (Smallwood and Spiegel 2005) includes 20-65% of the three largest turbine types in the APWRA in the high risk categories (Tiers 1 and 2), whereas only 7.4% of the remaining turbines are included as higher risk (Table 1).

Table 1. Approximate percent of the largest horizontal axis turbines in each risk classification (Tiers 1 – 5) according to the Smallwood and Spiegel (2005) risk models.

		Risk Levels (Tiers)					Grand Total
SITE	kW/Turbine	1	2	3	4	5	
KVS 33	400	2.6%	17.9%	2.6%	10.3%	66.7%	100.0%
WEG	250	10.0%	35.0%	15.0%	20.0%	20.0%	100.0%
Howden	330	35.1%	29.9%	19.5%	5.2%	10.4%	100.0%
All Turbines		3.2%	4.2%	8.5%	27.2%	56.9%	100.0%

We advocate modifying the CEC risk modeling approach using an alternative approach similar to Howell (1997). A simple hypothetical example illustrates the different approaches. Consider two turbine types, a Kenetech 56-100 turbine and a KVS-33 turbine. In this example, assume that 100 56-100 turbines were sampled monthly for one year and 5 raptor fatalities were found. Also assume 50 KVS-33 turbines were sampled for a year and 5 raptor fatalities were found. Table 2 illustrates the modeling approach used by Smallwood and Thelander (2004), and the alternative approaches we propose using either MW or RSA.

Table 2. Hypothetical example using Smallwood and Thelander (2004) modeling approach (number of turbines to determine expected fatalities) and two alternative approaches, one based on rotor swept area and another based on MW.

Smallwood and Thelander (2004) Approach (per Turbine basis)					
Turbine Type	# turbines	obs	exp	obs/exp	acc mort
56-100	100	5	6.67	0.75	-0.17
KVS33	50	5	3.33	1.50	0.17
subtotal	150	10			

Alternative A – (per Rotor Swept Area basis)					
Total RSA					
Turbine Type	(m ²)	obs	exp	obs/exp	acc mort
56-100	24885	5	3.68	1.36	0.13
KVS33	42765	5	6.32	0.79	-0.13
subtotal	67649	10			

Alternative B – (per MW basis)					
Total					
Turbine Type	MW	obs	exp	obs/exp	acc mort
56-100	10	5	3.77	1.33	0.12
KVS33	17	5	6.23	0.80	-0.12
subtotal	27	10			

In this hypothetical example, an individual KVS-33 turbine is estimated to be 2 times more likely to kill a raptor than the Kenetech 56-100 turbine. However, on a rotor swept area equivalent or MW equivalent basis, the 56-100 turbine is considered 1.7 times more risky. In this simple example, a larger reduction in mortality per MW of lost production would be achieved by removing 56-100 turbines compared to removing KVS 33 turbines. In addition, more total obstacles (towers) would be removed.

The next two example uses real data for red-tailed hawks taken from Appendix C of the CEC report. The factors “rated power output in kW” and “rotor diameter” were significant factors related to the location of red-tailed hawk fatalities. The data for “rated power output in kW” in Appendix C of the CEC report are reproduced in Table 3. The rank field shows the relative order from estimated most risky to least risky for both approaches. On a per MW basis, the larger turbines are considered moderate to low risk;

However, the risk analysis on a per turbine basis depicts these large turbines as high risk. In this alternative analysis, a larger reduction in mortality is expected by shutting down 1 MW of 65 kW turbines (approximately 16 turbines) compared with shutting down 1 MW of 400 kW turbines (2-3 turbines). From this example using real data and only considering this variable, shutting down 1 MW of 65 kW turbines is estimated to reduce red-tailed hawk mortality 1.5 - 4 times more than shutting down 1 MW of 330 or 400 kW turbines. This example is for illustration of the different methods, since small expected counts (<5) exist for several of the factor levels.

Table 3. Risk models for rated power output (kW) using the per turbine approach (Smallwood and Thelander 2004) and our alternative using a per MW approach. The rank field shows the relative order from most risky to least risky for both approaches.

Red-tailed Hawks Rated turbine power (kW) **	<u>Risk Analysis per turbine</u>				<u>Risk Analysis per MW</u>		
	observed	expected	obs/exp	rank	expected	obs/exp	rank
40	4	11.09	0.36	9	4.07	0.98	5
65	20	21.11	0.95	5	12.59	1.59	1
100	106	107.69	0.98	4	98.85	1.07	3
110	1	1.1	0.91	6	1.11	0.90	6
120	34	39.59	0.86	7	43.61	0.78	7
150	41	27.67	1.48	2	38.10	1.08	2
250	1	1.56	0.64	8	3.58	0.28	9
330	3	0.96	3.13	1	2.91	1.03	4
400	3	2.23	1.35	3	8.19	0.37	8

Table 4 contains red-tailed hawk results for the variable Rotor Diameter, again from data reported in Appendix C. The results in Appendix C identify the turbines with the largest rotor diameters as the most risky on a per turbine basis. On a rotor swept area equivalence basis, turbines with the largest rotor diameters are the least risky.

Table 4. Risk models for rotor diameter using the per turbine approach (Smallwood and Thelander 2004) and our alternative based on equivalent rotor swept areas (RSA). The rank field shows the relative order from most risky to least risky for both approaches.

Red-tailed Hawks Rotor Diameter (m)	<u>Risk Analysis per turbine</u>				<u>Risk Analysis per RSA</u>		
	observ ed	expected	obs/exp	rank	expected	obs/ex p	rank
13.5-14.8	6	13.54	0.44	6	7.82	0.77	5
16	18	18.66	0.96	3	13.78	1.31	1
17.2-17.8	108	115.08	0.94	4	101.69	1.06	3
19.1-19.5	36	42.03	0.86	5	45.17	0.80	4
23.4 - 25.2	39	20.5	1.90	1	34.93	1.12	2
31.4 - 33.2	6	3.19	1.88	2	9.60	0.62	6

Summary

The results of the risk modeling for variables directly related to turbine size, such as Model, rated turbine power, and rotor diameter would changed significantly using the alternative modeling approach. In addition, results for variables such as turbine density may change significantly, since the larger turbines are in less dense arrays (turbines are further apart). Finally, results for other variables may change as well, unless, the levels of each factors are based on turbines of approximately equal average size. For example, if the tubular tower turbines sampled during the CEC study were on average, approximately the same size as the lattice towers, then results on a per turbine basis or per MW basis would be the same. However, it appears the tubular towers are, on average, larger than the lattice towers, suggesting results would change for that factor. Since we have not been provided the data that identifies the sampling effort for each turbine in the CEC database, we cannot check the effects of turbine size on the model results.

We do not know exactly how much the risk characterization of individual turbines would change when considering all variables used in the risk model using this alternative approach. However, these initial examples strongly suggest there could be significant changes, especially for the larger turbines. We believe the models should be adjusted in the manner we identified in this document or in another appropriate way prior to identifying the final high risk turbine selection for management implementation.

References

- Howell, J.A. 1997. Bird mortality at rotor swept area equivalents, Altamont Pass and Montezuma Hills. California. Transactions of the Western Section of the Wildlife Society 33:24-29.
- Smallwood, K. S. and C. G. Thelander. 2004. Developing methods to reduce bird fatalities in the Altamont Wind Resource Area. Final Report by BioResource Consultants to the California Energy Commission, Public Interest Energy Research-Environmental Area, under Contract No. 500-01-019 (L. Spiegel, Project Manager).
- Smallwood, S. and L. Spiegel. 2005. Assessment to Support an Adaptive Management Plan for the APWRA. CEC released Technical Report. January 19, 2005.

ATTACHMENT 8

Altamont Pass Wind Resource Companies Recommendation for Peer Review Of California Energy Commission Science

The California Wind Companies feel strongly that, as a public agency strongly grounded in the pursuit of scientific knowledge, the California Energy Commission (CEC) should regularly submit their research for peer and public review. In that regard, we offer the following suggestions for a more open process for science conducted by the CEC.

PEER REVIEW

WHAT IS PEER-REVIEW? Scientific peer-review is a process by which technical experts provide unbiased comments, suggestions, and evaluation of the science and technology of proposals, study plans, data analyses reports, and other documents. Peer-review assesses the technical quality and relevancy of a document and evaluates how the document meets objectives or addresses hypotheses. Peer-review usually involves obtaining comments from appropriate technical experts (“peers”) who have no financial, supervisory, or familial relationship to the authors of the work. Peer-review is not simply an editorial review, nor does peer-review address political or other non-scientific features of a project or document.

Peer-review typically involves review by several technical experts in the appropriate subject area. By obtaining multiple, independent technical opinions, the peer-review process evaluate the scientific soundness of a product and minimizes introduction of bias or conflict of interest. However, the process of peer-review cannot insure that a document or product is without fault.

Peer review should be an efficient process so that monitoring, research, publications, and other work can proceed in a timely manner. This process should be streamlined and not create a bottleneck of bureaucracy that can delay appropriate publications, fieldwork, data analyses, or modeling.

WHY IS PEER-REVIEW NECESSARY? Peer-review can strengthen a study plan, proposal, or report in several ways. A reviewer provides suggestions for improvements of the work. Experts typically suggest better approaches, more efficient methods, innovative approaches to analysis, and supporting data or literature. A document or plan that has been peer-reviewed as sound achieves improved credibility and reliability in the eyes of the scientific community. Where proposals or study plans are developed to address specific needs, peer-review can insure that the project serves the specific objectives of the program.

WHEN SHOULD PEER-REVIEW BE USED? We recommend the process described in this document be used for products (proposals, plans, models, data, reports, protocols, etc.) funded by the CEC or conducted by CEC staff. All products produced by the CEC that are going to be released to the public and regulatory agencies and that influence permitting and management decisions should be considered for peer review. When products are related to the APWRA, the CEC should seek advice on the need for peer review from the Scientific Review Committee established by Alameda County. For most of the products, however, a high level of scientific quality may be maintained by soliciting peer-review from the Scientific Review Committee.

WHAT ARE THE PRIORITIES FOR PEER-REVIEW? From our perspective, the first priority for peer-review is implementation of the APWRA Adaptive Management Plan. Proposals and protocols for new research and monitoring activities necessary to meet CEC research goals, particularly on the APWRA, should be considered the next priority.

WHAT ARE THE CRITERIA FOR PEER-REVIEWERS?

1. No conflict of interest in the project document or its authors based on financial involvement, familial relationship with the author(s), personal bias for or against the institution or author(s), professional connection to the institution or author(s), organizational affiliation, or potential to be influenced by lobbying or other political pressure to produce a certain result or more work in the area of this product.
2. Expertise appropriate for the theme of the project or document(s). If statistical analyses are conducted, and/or statistical inferences are made, at least one statistician should be included as a reviewer.
3. The ability to complete a technical review in a reasonable time.
4. Individual peer reviewers should be selected from a diversity of institutions, including state, federal, local government, and non-governmental organizations for each project, while avoiding members from the same entity, institution, or agency as the author(s).

WHAT FORM SHOULD PEER-REVIEWS TAKE? Reviewers should provide written comment on the document(s) under review. Reviews should be conducted similar to the system and methods used by the National Science Foundation and major scientific journals. Peer-reviewers should remain anonymous to the author unless the reviewer chooses to share his/her identity.

WHAT SHOULD BE DONE WITH PEER-REVIEWS? We believe that peer-reviews should be available for public review. When the peer-review relates specifically to the APWRA, we believe the results of the review should be provided to Alameda County, the companies, and the Scientific Review Committee if they are not providing the review. The peer-review process does not determine the approval or disapproval for the research or management activity associated with the request (funding a study, use of data or analytical results, publication of a report, etc.). Peer-reviews may not be definitive (i.e., there may be disagreement among reviewers). The CEC, the county, the Scientific Review Committee, or other entities directly affected by the review are not required to accept all peer-review recommendations. However, the CEC should respond to each of the peer-review recommendations and that response should be available for public review.

DOCUMENTATION OF PEER-REVIEW CONDUCTED OUTSIDE THE CEC

There likely will be cases where the CEC will benefit from models, data, analyses, or conclusions drawn by projects developed in the past or ongoing but supported by other institutions. There is no intent to duplicate the peer-review conducted by others. Scientific journals typically conduct their own peer-review. Most major journals have high-quality peer-review that is universally accepted. The CEC should encourage its staff and consultants to publish their findings in the peer-reviewed scientific literature whenever possible and appropriate.

WHAT SHOULD A PEER-REVIEW INCLUDE? A peer-review must provide an unbiased opinion of the scientific quality of a product (proposal, report, data, map, etc.) by individuals who are independent from the authors and external to them and their institution. A review must be independent of various types of conflicts of interest with the author(s) and with the product under review. The CEC should place considerable reliance on the objectivity, integrity, and professionalism of each peer-reviewer to provide technical opinion of each product without bias or conflict of interest.

Peer reviews should address numerous questions including but not limited to:

- Do the objectives/hypotheses appropriately address the needs identified for the research?
- Are the objectives/hypotheses scientifically sound, testable, and appropriate given the type or precision of the data available?
- Is the design of the study scientifically sound?
- Is it technically and statistically appropriate for addressing the goals and objectives of the project?
- Is the reasoning behind the design based on generally accepted scientific principles?
- Are the methods and experimental design appropriate in scale, timing, geographic scope, and precision for addressing the objectives?
- Are the measurements appropriate for addressing objectives?
- Is the data analysis sound and likely to address the objectives?
- Are the authors and their institutions well qualified, with appropriate facilities, to conduct the work?
- Are the time frames, personnel, and budget appropriate for conducting the work?
- In work already completed, did the research follow the protocols?
- Are the discussion and conclusions relevant to the study objectives and based on the results of the study.
- Did the products meet the needs identified?

PUBLIC REVIEW

The CEC is a public agency funded with public funds. As a result, we believe the agency's research plans and products should include review by the public. We believe, for the most part, that CEC planning is a very open and public process. We applaud the CEC effort to involve the public through the web site and through planning documents such as the Pier Roadmap. However, we believe that the CEC and its staff should make a greater effort to involve stakeholders in the planning and conduct of research. In particular, we encourage the CEC to involve the companies in the planning and development of research directly effecting their operations. This planning should allow for a free exchange of ideas on how the research is to be conducted and how the companies can participate without potentially damaging their ability to operate. This cooperative planning may allow for more efficient use of research dollars through cost sharing of some projects.

As a California industry, we are frequently affected by scientific studies, particularly studies conducted by the CEC. We feel strongly that we should be afforded the opportunity to

participate in this process. The following is our recommendation for steps to be taken input from major stakeholders:

1. Development of Hypotheses
2. Experimental Design and Protocol Development
3. Peer-Review/Stakeholder Input
4. Research
5. Analyses/Draft Report
6. Peer-Review/Stakeholder Input
7. Publication of Proposed Conclusions and Recommendations
8. Public Participation in the form of formal public meetings and/or workshops.

SAMPLE INSTRUCTIONS TO PROSPECTIVE PEER-REVIEWERS

CONFIDENTIALITY - The enclosed manuscript is a privileged communication. Please do not show it to anyone or discuss it, except to solicit assistance with a technical point. Your review and your recommendation should also be considered confidential.

TIMELINESS - In fairness to the author(s) and to the needs of the Program, please return your review within ___ days. If it seems likely that you will be unable to meet this deadline, please return the manuscript immediately or contact the Executive Director.

CONFLICTS OF INTEREST - Please review the “Independence of a Peer-Review” above. If you feel you might have any difficulty writing an objective review, please return the paper immediately, un-reviewed. If your previous or present connection with the author(s) or an author’s institution might be construed as creating a conflict of interest, but no actual conflict exists, please discuss this issue in the cover letter that accompanies your review.

YOUR REVIEW SHOULD ADDRESS THE FOLLOWING:

What is the major contribution of this document? What are its major strengths and weaknesses, and its suitability for publication and/or use by the Program? Are conclusions based on sound scientific methods and reasoning? Please include both general and specific comments bearing on these questions and emphasize your most significant points.

General Comments:

1. Scientific soundness
2. Organization and clarity
3. Conciseness
4. Degree to which conclusions are supported by the data
5. Cohesiveness of conclusions

Specific Comments:

Please support your general comments with specific evidence and literature. You may write directly on the manuscript, but please summarize your handwritten remarks separately.

Comment on any of the following matters that significantly affected your opinion of the manuscript:

1. Presentation: Is a tightly-reasoned argument evident throughout? Does the manuscript wander from the central purpose?
2. Methods: Are they appropriate? Current? Described clearly and with sufficient detail so that someone else could repeat the work?
3. Data presentation: When results are stated in the text of the manuscript, can you easily verify them by examining tables and figures? Are any of the results counterintuitive? Are all tables and figures clearly labeled? Well planned? Too complex? Necessary?
4. Statistical design and analyses: Are they appropriate and correct? Can the reader readily discern which measurements or observations are independent of which other measurements or observations? Are replicates correctly identified? Are significance statements justified?
5. Conclusions: Has the author(s) drawn conclusions from insufficient evidence? Are the interpretations of the data logical, reasonable, and based on the application of relevant and generally accepted scientific principles? Has the author(s) overlooked alternative hypotheses?
6. Errors: Point out any errors in technique, fact, calculation, interpretation, or style.
7. Citations: Are all (and only) pertinent references cited? Are they provided for all assertions of fact not supported by the data in the manuscript?

FAIRNESS AND OBJECTIVITY

If the research reported in this paper is flawed, criticize the science, not the scientist. Harsh words in a review will cause the reader to doubt your objectivity; as a result, your criticisms will be rejected, even if they are correct!

Comments should show that:

1. You have read the entire manuscript carefully,
2. Your criticisms are objective and correct, are not merely differences of opinion, and are intended to assist the author in improving the manuscript.
3. You are qualified to provide an expert opinion about the research reported in this manuscript.

ANONYMITY

You may sign your review if you wish. If you choose to remain anonymous, avoid comments to the authors that may serve as clues to your identity, and do not use paper that bears the watermark of your institution.

RATING:

Please score each aspect of this manuscript using the following rating system: 1=excellent, 2=very good, 3=good, 4=fair, 5=poor.

	Rating
Scientific soundness	_____
Degree to which conclusions are supported by the data	_____
Organization and clarity	_____
Cohesiveness of conclusions	_____
Conciseness	_____
Importance to objectives of the Program	_____
(For use by internal review panel only)	
RECOMMENDATION	(check one)
Accept	_____
Accept after revision	_____
Unacceptable	_____

Please provide comments on separate sheets of paper. Support your comments with specific evidence from the text.

ATTACHMENT 9

**CALIFORNIA WIND COMPANIES COMMENTS ON THE
2005 ENVIRONMENTAL PERFORMANCE REPORT OF CALIFORNIA'S
ELECTRICAL GENERATION SYSTEM (EPR)¹**

prepared in support of the

**2005 Integrated Energy Policy Report Proceeding (04-IEPR-01G)
CEC-700-2005-016**

The California Wind Companies appreciate this opportunity to comment on the 2005 Environmental Performance Report and offer these comments in conjunction with the attached Reply Comments and the WEST comments on the Staff Avian Report.

P. 5²

At the Altamont Pass Wind Resource Area in Alameda County, estimates of bird mortality range from 881 - 1,300 raptors and 1,766 - 4,721 total birds killed annually.

This baseline mortality number is the subject of review by the Alameda County Scientific Review Committee as a primary topic. On July 7, 2005, the Alameda County Board of Supervisors adopted a framework for permit conditions in the APWRA that includes the initiation of a Scientific Review Committee of recognized experts to openly address recommended wildlife management measures and explore new mitigation measures. We are expecting this board of experts to be empanelled in the near future.

Alameda County has instituted a moratorium on wind energy development at Altamont at the existing level of 580 MW until the avian collision issue is resolved.

The Alameda County moratorium was established to limit wind development in general.

¹ The California Wind Companies are Altamont Infrastructure Company, Green Ridge Power Company, Global Renewable Energy Partners, PPM Energy, Inc., Altamont Winds Inc., SeaWest Power Resources, LLC, and enXco, Inc.

² All page references are to the 2005 EPR. EPR excerpts are in plain type, and the California Wind Companies' comments are in italics.

Studies from the Solano County Wind Resource Area indicate that raptor species such as red-tailed hawks and kestrels are even more prevalent than at Altamont Pass, which is resulting in higher levels of mortality for some raptors and bats. Developing wind energy resources in Solano County without addressing bird, raptor, and bat mortality could create problems with slow permitting, unacceptably high mortality rates for avian species and negative publicity for the wind energy industry at a second major wind resource area. In order to reduce avian collisions and mortality in Solano County, mitigation measures need to be developed and implemented that are based on thorough field research that determines the extent and causes of mortality.

As described in the text of the Reply Comments, such statements contradict the extensive and thorough Solano County permitting process for both High Winds and Shiloh projects. Furthermore, these statements are not based on the actual monitoring data that are being collected in Solano County from operating projects. For this reason, the highlighted text should be stricken from this report as the mitigation measures have been developed and are being utilized.

P. 6

New research funded by the Energy Commission's Public Interest Energy Research Program seeks to determine what mitigation measures can effectively reduce bird kills at the Altamont Pass to a level that allows for expansion and repowering.

This statement raises the question of what NEW research is being done when the measures that were recommended in the August 2004 report have not yet been implemented. While seemingly innocuous, the words "effectively reduce" to a "level that allows for expansion and repowering" has led some stakeholders, such as the California Attorney General, to conclude that more study and more mitigation is needed now rather than allow the current, and carefully crafted, Alameda County permitting framework of measures to be implemented and tested for effectiveness. That framework includes seasonal shutdown, repowering requirements, shutdown of high risk turbines and the initiation of an Altamont Environmental Impact Report as soon as possible in addition to the creation of the Scientific Review Committee discussed above. Careful consideration must be afforded to what is already being implemented by Alameda County utilizing previous CEC PIER research and processed through Alameda's County's Scientific Review Committee

Furthermore, any new research must be identified and discussed in a public forum with full and complete peer and public review as discussed in the Reply Comments.

A few turbine owners have agreed to implement new measures to reduce the number of

bird collisions, and some high-risk turbines will be removed or shut down during the winter season when bird collisions are highest.

This sentence suggests that there is limited participation in the APWRA by turbine owners. The industry has been working hard to implement avian fatality reduction measures, but its efforts have been continually impeded by permitting appeals and environmental lawsuits. The avian interaction issue at APWRA is extremely complex and involves a myriad of stakeholders, including local governmental authorities, resource agencies, regulatory agencies, environmental concerns, and landowners. In 2004 a Wind Power Working Group (“WPWG”) was formed by Alameda County comprising all the aforementioned stakeholders, to develop resolutions to the avian interaction issues including appropriate avian fatality reduction measures. Furthermore, industry has begun implementing measures during this WPWG process, such as relocating or shutting down high risk wind turbines and power pole upgrades (in addition to the numerous other measures industry has taken over the past two decades). To imply that industry is not fully committed to efforts to reduce bird collisions in the APWRA, without giving due consideration to all the facts, requires clarification.

In fact, all turbine owners will have to comply with the same conditions as set forth by the Board of Supervisors for the APWRA turbines in Alameda County . For example, the turbine owners’ proposal for seasonal shutdown is an experimental measure for all of the turbines that have not been repowered to be shutdown 50% at a time for two months of the winter season to determine its effectiveness in reduction of avian mortality..

The sentence should read:

All APWRA turbine owners in Alameda County are being required to implement new measures to reduce the number of bird collision: high risk turbines will be identified and either removed or shutdown, and all turbines will be subject to an experimental seasonal shutdown during the winter when bird collisions are projected to be high and wind production low.

Several agencies and an industry consortium have prepared guidance documents that describe best practices for reducing avian collisions and mortality, but the guidance is not widely used or uniformly adopted. Fragmented jurisdiction between local, state, and federal agencies and non-coordinated regulatory programs contribute to an inefficient regulatory approach. Most species of birds and raptors are protected under the Migratory Treaty Bird Act and the Bald Eagle Protection Act, but neither statute is being used effectively to reduce fatalities of hawks and eagles.

Enforcement of the Federal statutes would NOT create new mitigation measures for avian mortality but rather would create a strict liability criminal penalty that would

discourage the operation of the wind turbines. The jurisdictions have been attempting to coordinate efforts to ensure the greatest degree of avian mortality reduction, relying on the counties as the source of primary permitting jurisdiction.

P. 15

Further, most bird species being killed are protected under state and federal laws and are thus of concern to the public at large as well as environmental and wildlife law enforcement officials.

What does this mean? How is it substantiated? Since most bird species have protection under state and federal, this statement needs to distinguish the impacts caused by wind turbines from all other sources of avian mortality.

As wind energy production expands, the rotor swept area of turbine blades increases and more birds will be at risk of collision.

Does this mean the size of the turbine? The amount of generation? The swifter the blades? The number of turbines?

To lower risks to birds, the developer should conduct protocol level bird use surveys prior to development. Expansion or repower projects should be required to incorporate mitigation measures and monitoring, and to report the results so fatality rates and mitigation efficacy can be assessed. Using that information, they can then site turbines to avoid areas of high avian use. Additional wind development to meet the RPS goals is feasible while at the same time limiting the avian impacts.

This type of survey, mitigation and monitoring is already being performed and required as part of the permitting processes at the County level. If the counties are told that the California Energy Commission, or its staff, believes that more needs to be done than is currently being identified through comprehensive environmental review, such statements in this Staff Report can hinder the development of new wind projects rather than make it feasible.

The wind siting and mitigation guidelines produced by the National Wind Coordinating Committee and the U.S. Fish and Wildlife Service to date are voluntary and the level of implementation by industry and local agencies vary. Statewide guidelines for wind energy projects may be an appropriate way to gain consistency statewide when

developing and mitigating projects. Statewide standards could also remove a significant environmental barrier to increasing wind energy in the state.

See Reply Comments of California Wind Companies (attached). Statewide guidelines would give the CEC de facto siting jurisdiction and ignore the unique qualities of each resource area and technology.

We believe that the current regulatory structure which vests the primary siting authority for wind in local government and utility districts is working well and does not need fundamental change. In the Alameda County permitting process for the APWRA, several CEC PIER Staff Assessments were issued with the stated purpose of assisting the County's permitting process. Yet, among other issues, these documents contained contradictory results regarding the nature and identification of high risk turbines to be selected for permanent shutdown, and illustrate the uncertainty with their estimates of turbine risk and the need for peer and public review.

This section leaves the impression that the wind industry is ignoring available siting and survey guidelines. In the specific example used concerning guidelines published by the National Wind Coordinating Committee ("NWCC"), the industry was directly involved with preparation of these guidelines as a participant in the NWCC. In the specific example of the industry taking issue with implementation of the USFWS's voluntary interim guidelines, the issues taken generally revolve around these guidelines having been issued without wind industry involvement and their being treated in certain regions of the U.S. as mandatory without regional discretion, rather than as voluntary guidelines. The American Wind Energy Association ("AWEA"), the principle wind industry trade organization, has represented the industry to the USFWS and has lately been successful in involving the industry in the USFWS's efforts to improve their guidelines and to have them implemented in a way that keeps regional siting issues in focus, since environmental considerations vary greatly from region to region.

P. 16

In the Altamont Pass Wind Resource Area, the Energy Commission Could Encourage Industry to Apply Mitigation Measures to Existing Projects, New Projects and Repowering Projects to Reduce Bird Deaths

The California Wind Companies take exception to the "encouragement" unless there is a formal public and peer review process followed. As discussed above, the APWRA has already had a comprehensive process before the Alameda County Board of Supervisors, including input from PIER staff, that resulted in a permitting framework. We recommend revising the text as follows:

Over the last 20 years, researchers have documented the levels of bird use and mortality in the Altamont Pass. PIER-EA funded studies to develop a list of mitigation measures that could reduce bird kills (Smallwood and Thelander 2004, Smallwood and Neher 2004,). As a next step, industry will implement the mitigation measures selected by Alameda County and monitor those measures Atamont-wide to determine their effectiveness. Two measures that are projected to reduce bird kills are seasonal shutdown (winter months) or removal of wind turbines in the highest risk areas. While these measures are anticipated to reduce bird kills, implementation will also result in a loss of generation.

In the Solano County Wind Resource Area, the Energy Commission Could Encourage Industry to Reduce Existing Impacts on Birds and Bats

Solano County has already addressed these issues as part of its CEQA process. As discussed in the specific comments on the Staff Avian Report, the information needed to assess the impacts of the operation of the High Winds project is being collected and analyzed by a Technical Advisory Committee. This paragraph should acknowledge those efforts rather than dismiss them. High Winds is one of the more recently licensed and operational wind projects utilizing modern wind technology.

NOTE (for the topics on the rest of p. 16): Any suggestions for further research must be prefaced by indicating that it will be subject to full peer and public review according to Commission-adopted protocols before being released.

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Wind power and Avian Mortality

See previous specific comments

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Wind Energy

We have provided specific comments on the Staff White Paper that has been referenced in the WEST Comments.

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The mitigation measures developed for the Altamont Pass still need research to determine their effectiveness. These mitigation measures are currently not implemented elsewhere since more information on bird behavior and risk is needed for other wind resource areas.

We agree.

Using New Mitigation Measures to Site Turbines in the Altamont Pass

Highlighting only the Buena Vista project ignores the efforts that have been made at other repowered projects, namely Diablo Winds, High Winds, and Shiloh, all of which utilize new wind technology. It should be noted that Mr. Smallwood served as a consultant to the Buena Vista project.

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To help lessen the avian impacts of wind turbines, staff believes the Energy Commission may want to consider various policy options that are included in the 2005 Environmental Performance Report white paper entitled Assessment of Avian Mortality from Collisions and Recommendations [sic].

Before considering the policy options in the Assessment of Avian Mortality from Collisions and Electrocutions, (CEC 700-2005-015), the California Wind Companies recommend that the Commission conduct a comprehensive public review process for that document and its underlying research taking into consideration the comments received as part of the IEPR proceeding.